

POPULAR Computing WEEKLY

Only 45p.

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Vol 4 No 24



DOMARK, which launched its *A View To A Kill* game based on stunts used in the new James Bond film of the same name last week (pictured above), is rumoured to be in negotiations to develop a game on *Biggles*, a film due out this Christmas, featuring Captain W E Johns' famous air ace, immortalised in over fifty novels.

Domark's marketing manager Rory Curran however denied that any *Biggles* game was planned.

Amiga's arrival pressures Atari

COMMODORE looks set to launch its Amiga computer - a rival for Atari's ST and Apple's Macintosh - on July 18, in the US.

The machine includes a built-in monitor and single disc drive, and will sell for \$1995 (around £1540).

Following last week's Consumer Electronics Show in Chicago, more details of the machine's design have emerged. The 68000 processor-based micro offers 256K

Ram expandable with a Ram pack to 512K. A 192K Rom includes a mouse-operated windows/icons operating system which Commodore calls 'intuition' and a disc operating system, Amiga-DOS. The machine also includes three custom chips handling animation (Agnus), graphics (Daphne) and sound (Portia).

Graphics display offers either a 60 or 80 column text display, hardware sprites, up

to 4096 colours, and its 32K screen offers a range of display resolutions (with different numbers of colours possible) from 320 x 200 pixels up to 640 x 400 pixels.

The sound chip gives four sound channels (or twin stereo tracks) over nine octaves. The chip also handles disc and joystick input/output.

As well as the built-in 3½ inch double-sided double-

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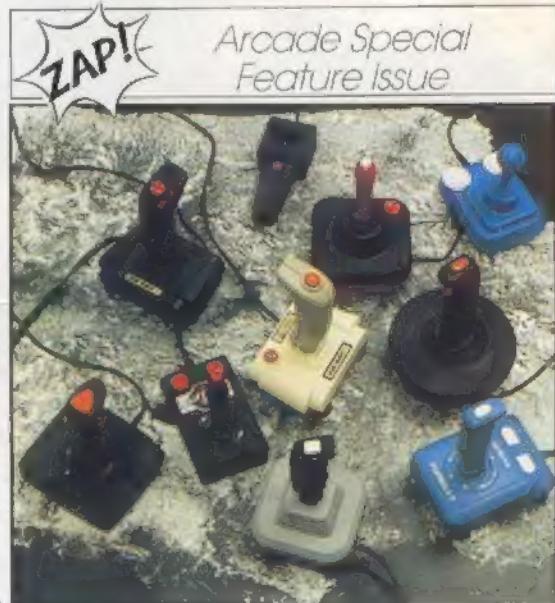
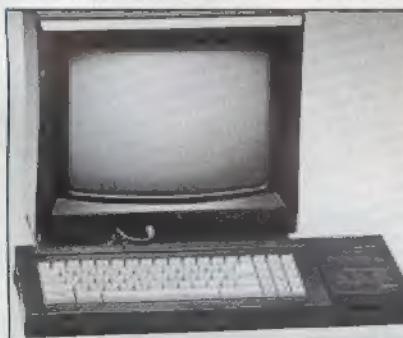
Amstrad goes for US 128K

AMSTRAD has launched a 128K version of its disc-based CPC 664 at the Summer Consumer Electronics Show held in Chicago last week. The

new model is intended for sale in the US this autumn.

Like both Amstrad's previous machines, the CPC 6128 - as it is called - is being offered together with a choice of either monochrome or colour monitors. The green screen version will cost \$699 (around £540) and the colour version will cost \$799 (around £620).

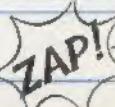
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Arcade Special Feature Issue

INSIDE ▶

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View

Sinclair's troubles continue. Hardly a day goes by without further articles adding fuel to rumours of financial instability at Britain's top micro company.

Considering that Sinclair is currently carrying somewhere around £30m of unsold stock, it is hardly surprising that the strain is beginning to show. Further, with home micro sales significantly reduced across the board, Sinclair has now to find money to buy the components it will need to manufacture its models to be sold this Christmas.

Now it would be easy – as many have – to write Sinclair off as a spent force. But that would be to seriously underestimate the strength of Sinclair and indeed the strength of Sir Clive.

Despite the unexpectedly vicious down-turn in post-Christmas sales the company is still holding on to its approximately 40 per cent share of the market.

Sinclair is astonishingly good at spotting emerging consumer areas and exploiting them before anyone else. Yet he does so within the constraints of entirely conventional (and so less capital intensive) technologies. Somehow he always manages to find 'windows' of opportunity that others miss.

Some, like the Spectrum, have been wildly successful and so tremendously profitable.

Admittedly others are too risky to be successful, like the C5. Some are brilliantly conceived, but go off half-cocked, like the QL. And some grasp success from the jaws of disaster, like the flat screen TV, which now finally looks like coming good.

Sinclair has always walked a difficult tightrope. But he has proved himself a survivor.

POPULAR Computing WEEKLY

Presents . . .

News > More Chicago Show news



Joystick Review > A two page summary of the slickest and quickest available



Arcade Addicts Guide > Four packed in pages of pokes and tips for virtually any game you've ever played!

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Star Game > A high speed machine code version of the classic race 'n' chase strategy game

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Futures . . .

C128 reviewed... check your chess grade on the Commodore 64... machine code strategy board game on the Spectrum

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ABC

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Computer Trade Association Magazine of the Year

Oric bought by French company

ORIC Products International has finally been bought from the receiver by Eureka Informatique, a French distribution company.

Eureka Informatique - which was formerly known as SPID - has acquired all rights to all names, products and current stocks. The company will be restarting production of the Oric Atmos and Stratos machines in its newly purchased factory in Normandy,

France. The offices in Cambridge, previously occupied by Oric, are to be sold off independently.

Before it crashed, Oric was also working on an IBM compatible machine and a portable model. "A substantial part of the technology relating to these machines is available to Eureka," said Cameron MacSween, a consultant who handled the negotiations between Eureka and the receiver.

Dennis Cross of Chater and Myhill. "I do not know, however, if work will now continue on them - I suspect it is unlikely."

He added that Eureka had no plans to set up a manufacturing facility in the UK, although prior to the purchase, discussions had been held with Barry Muncaster of Oric Products Export, with a regard to making the machines available in this country.

Amstrad goes for US 128K

◀ continued from page 1

The machine is Z80-based and the 128K Ram capacity is achieved by bank-switching two 64K Ram blocks. The CPC 6128 includes a built-in 3 inch disc drive and is upwardly software compatible with the CPC 464 and 664.

The machine is being distributed in America by a new Chicago-based distributor, Indescomp Inc, with Amstrad acting purely as manufacturer. Indescomp Inc was set up in January this year by Indescomp SA, Amstrad's Madrid-based Spanish computer distributor.

"Amstrad is not financially involved in the project in any way," said Amstrad's William Poel.

It is not clear whether the CPC 6128 will be launched in the UK. "The 6128 is being displayed for the benefit of the US market. We had to launch at CES in order to take machines into the shops in the autumn".

"It has somewhat perverted Amstrad's usual principle of not showing anything until it's ready," William Poel continued.

Alan Sugar, Amstrad's chairman, said that the 6128 was more likely to come to Britain early next year, as there was no need to add to Amstrad's range at the present time.

The CPC 6128 will initially be sold in the US through a deal with retail giant Sears Roebuck.

Space robots kit crosses Atlantic

TOY MANUFACTURER Milton Bradley has launched a new range of motorised construction kits, which can be made into various vehicles, and which should soon be

capable of being interfaced with a home micro.

The company is stressing the educational potential - schools in Wales have been experimenting interfacing the models with BBC Bs via a control box, using them much in the same way as turtles.

Milton Bradley has no plans to launch its own interface, but is considering applications for licences from a number of UK companies.

There are three major sets at present, plus an expansion set. The price ranges from around £20 for the expansion set, to between £60 and £80 for the largest set.



Hopes of Sinclair progress hindered by accounts delay

A MEETING of Sinclair's major creditors was held last week, at which a level of support for the troubled company was agreed.

The meeting was held largely because of the action of Sinclair manufacturer Timex, in selling its stock of Spectrums to Zeta Services (see *Popular Computing Weekly*, June 6) in order to recoup some money on Sinclair products.

The main parties at the

meeting were Barclays, Citibank, Thorn Emi, Timex and AB Electronics.

The Bank of England has also undertaken to provide a chairperson from its industrial finance division to chair negotiations between Sinclair and potential investors.

However, serious talks cannot begin until Sinclair's auditors complete last year's accounts. These were due to be ready last week, but have been delayed.

Amiga hits Atari ST

◀ continued from page 1

density drive - with a formatted capacity of 880K - the machine includes a detachable 89-key keyboard, two-button mouse (configured for one joystick port), twin joystick ports, supplementary disc, Centronics parallel, RS232C serial and Ram expansion interfaces and stereo audio, domestic TV and RGB monitor outputs.

The machine's sophisticated Intuition operating system offers special facilities for multi-tasking, window handling and animation.

Commodore also plans to offer - to complement the machine - a range of printers, additional disc units (both 3½ inch and 5½ inch), a 1200 baud modem, hard disc unit (up to 8M), a video controller package including a genlock interface and frame grabber, and a Midi music interface.

Commodore views the Amiga machine as a very significant launch for the company and is aiming it at a broad spectrum of applications in the entertainment, education and home business areas.

If UK launch is expected early next year, "it will not be announced before January," said Commodore UK's general manager Nick Bessey. "But I would put money on an announcement in January."

Acorn boss appointed from Olivetti

ACORN has announced that Alex Ubaldi, a senior director at Olivetti, has been appointed as acting managing director at the Cambridge computer company.

The post had been left vacant after Olivetti rescued the company in February.

Acorn's chairman, Dr. Alexander Reid, had no comment to make on the appointment last week.

Following the rescue Acorn's shares have still failed to make a recovery. After dipping as low as 9p at one point last week, they currently stand at 13p. Before Acorn's troubles the shares stood as high as 114p.

Receiver called in

PROTEK, developer of the Protek joystick interface, a Spectrum modem, and the Spectrum game *Hunter Killer*, has called in the receiver.

D J Watt of accountants Cork Gully's Edinburgh office, has been appointed to handle the receivership.

• Romik, the software company which crashed in March, had debts totalling over £100,000, a creditors meeting revealed last week.

Software auction

AN AUCTION of computer software in aid of the Ethiopian Famine Appeal is being held at County Hall, London SE1 on June 15, starting at 11 am.

Lots will include software titles from US Gold, Activision and Quicksilva among others. The auction is being organised by the industry publication *Computer Trade Weekly*.

First showing of C128 at show

THE highlight of the 6th Commodore Computer Show, held in London between June 7 and June 9, was undoubtedly the first public showing of Commodore's new C128 machine in this country.

Both models, the basic C128 and the C128D - with built-in single 5½ inch disc drive - were shown.

Commodore has still not announced a definite release date or price for the C128 machines. The machine is expected to be available in vol-

Commodore's new C128 machine

ume by September, but may be released to some dealers during the summer. "The C128D will be launched around September or October," said Paul Welch, Commodore's UK sales and marketing manager. The price for the basic C128 is expected to be between £300 and £350, while the built-in disc version is likely to be considerably more expensive, probably nearer £800-£800.

The new 1571 disc drive will also be launched at the

same time as the C128. This is fully compatible with the C128, operating as a 1541 in Commodore 64 mode, and as a much faster drive in CP/M and 128 mode.

Also at the show, Commodore previewed a new colour monitor, the 1902. The current 1701 monitor has only a 40-column screen, and so cannot be used with the 128 in CP/M or 128 mode.

Paul Welch also announced one more bundling package for Commodore 64 selling the 1541 disc drive, Commodore modem and *Easy Script* together for £229. The price includes a year's subscription to *CompuNet*.

Commodore has already announced three other special packs: a £199 deal to pack the Commodore 64 with cassette player and *International Soccer*, the £449 *Plus/4 Business Pack* (see *Popular Computing Weekly*, June 6) and the £349 pack offering the 1541 disc drive, MPS 801

continued on page 7



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BLOCK

CAN YOU WAIT?



Letters

QL command

I don't know if other QL users will find the following of any interest to them, but there is one command on the ZX Spectrum which I would dearly like to have on my QL. That is the use of Line when used to auto start a program loading, eg, Save "name" Line 200 would cause a program, when Loaded back, to start from Line 200.

On the QL, however, you have the LRun command which causes a program to start from the beginning which would then need Gotos Gosubs or Procedure calls to start from the specified part of the program.

I have found a very simple way around this difficulty and that is to Open a file to microdrive and list the program to it, ending with Printing "Run".

To try it, first have a program in memory then enter as direct commands the following:

```
OPEN S:MDV1 name : LIST 5 :  
PRINT 5,"RUN xxx" &  
CHR$(10) : CLOSE 5
```

Now, whenever the program is Loaded back by either the Load MDV1, etc, or LRun MDV1, etc, the program will start from the line specified in the print statement above; Run xxx, where xxx is the number.

D Hayward
No4 Lane End
Whelford
Gloucester



"64K's enough for British Amstrad users - but in America everything's got to be bigger."

Monolithic

R Vol 4 No 18.

I entered the listing that was on the Monolith and then typed Run and for some reason my monitor became 12 feet tall and its weight increased to five tons.

I might have misread some of the hieroglyphics.

W G Gillett
74 Castaway South
Leasowe
Wirral
Merseyside L46 1PB

computer.

If they wanted to, the chain stores could end the computer industry in about a month's time.

J M Shearing
Ivy Mill Lane
Godstone
Surrey
RH9 8NB

Minor bug

During abusive treatment of my Bank Account program I have found a minor bug.

Statement of Account: It has been found that if the option "EXAMINE/DELETE ENTRIES" is selected before any Data has been entered for the month in question, the program will stop with an error report.

This will be eliminated by adding the following line:
6045 IF s(1,2)=0 THEN
GOSUB 420: RETURN

D G Sheddell
Belchamp St Paul
Sudbury
Suffolk

Out of stock

It seems a shame now that even chain stores can decide if a computer sells or not. I am of course talking about the events concerning Commodore that happened recently.

When the chain stores find themselves out of stock they also find they cannot buy new stock at a cheaper price and so discontinue the computer. The manufacturer finds it is now unable to sell the

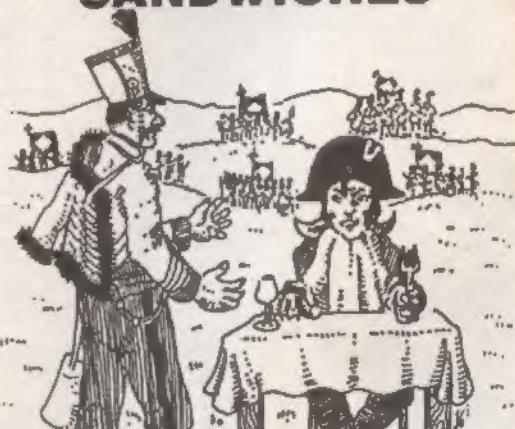
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Chicago Show dominated by Activision and Epyx

NEW software at the Consumer Electronics Show, held in Chicago between June 2-5, was greatly reduced from last year in the games and educational areas, although Activision, Epyx and Broderbund introduced major new titles.

Broderbund, one of the largest US software companies, concentrated its new releases on the Apple II range.

One of the software highlights of the show was the preview of Epyx's *Summer Games II* and *Winter Games*.

Winter Games follows the



same format of sophisticated graphics and complex animation as the original *Summer Games*. The earlier game has now sold over 200,000 copies in the US alone according to Epyx. *Winter Games* features

ketball, *Tennis* will be in the shops this month at £5.99.

Commodore also announced the addition of *Sound Studio* and *Sampler* to its music series. Like *Music Maker* and the *Playalong* album series, the two new packages were developed by Music Sales. *Sound Studio* turns the C64 into a music synthesiser and multi-track sequencer; *Sampler* enables the user to record any sound and then alter it and play it back over a 10-octave range.

Sound Studio will be available by the end of the month at £14.99, *Sampler* is intended to be a Christmas release at £69.99.



Test cricketer Graham Gooch

Also on the musical side, Island Logic's *Music System* has been converted to the C64 and was on show.

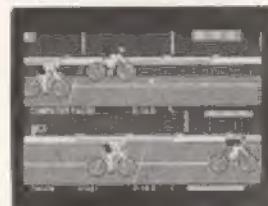
Precision launched a new C64 word processor, *Superscript*, an enhanced version of *Easyscript*, a low cost version of its acclaimed *Superbase*, called *Superbase Starter*, and *Supertype*, a typing tutor. *Superscript* costs £69.99, *Superbase Starter* £39.95 and *Supertype* £19.95.

Continuing with sports simulations, Commodore itself launched *International Tennis*, the latest in the series which includes *International Soccer* and *International Bas-*

six winter sports: skiing, the ski jump, a ski biathlon, figure skating, freestyle skating and bobsleighing.

Summer Games II adds eight new sports to the original title - rowing, triple jump, javelin, high jump, fencing, cycling, kayak canoeing and show jumping.

While *Summer Games II* will be available in the US this summer, *Winter Games* will not be released until the autumn.



Following on from Epyx's deal with Lucasfilms which produced *Ballblazer* and *Rescue on Fractalus*, the company has announced it will be publishing two more Lucasfilm games, *The Eidolon* and *Koronis Rift*.

The Eidolon is an arcade adventure set around the Eidolon, a 19th century time machine, which transports the player to a land of caverns, trolls and dragons. The task is to track down the missing inventor of the Eidolon.

In *Koronis Rift*, the player must try to recover weapons used by ancient civilisations, destroying the base held by hostile guardians of the ancients' weapons.

While the new Epyx games should reach the UK through licensing deals, it will not be from CBS, since the contract between the two has been terminated. US Gold is strongly rumoured to be taking over the Epyx licence.

Activision's new titles, which should be released in this country through Activision UK, showed a greater emphasis on simulation games, and surreal scenarios. *Ghostbusters* author David Crane's latest effort ■ *There's Someone Living Inside My Computer*. The screens show a diagrammatic representation of a house, with your computer dweller

inside, with whom you can converse via the keyboard.

Hacker from Activision is an adventure with a plotline similar to *System 15000* in this country - the computer plays the part of a computer, with the player as a hacker, trying to discover what you have hacked into.

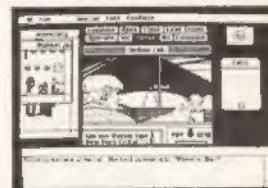
Fast Tracks is a computer 'slot-car' construction kit, while the idea of *The Great American Cross Country Road Race* is self-explanatory.

Activision announced that it has signed a deal with Lucasfilm, to publish its titles outside North America. *Ballblazer* and *Rescue on Fractalus* should be available in Europe and Australia this summer.

Simon and Schuster announced a text adventure based on *Star Trek*, called *Star Trek: The Kobayashi Alternative*. The player takes the part of Captain Kirk, and must use the Enterprise crew and resources to solve an intergalactic mystery. A Commodore 64 version of the game will be available in the States in October.

Mindscape announced two licensed titles, one based on a Stephen King novel *The Mist*, the other, interestingly enough, based on *A View to a Kill*. Mindscape's version, however, is a text adventure covering all the action of the film rather than three separate segments.

Mindscape also showed a graphic adventure for the Macintosh, called *Deja Vu*.



designed specifically to use the Mac's hi-res graphics, windowing capabilities and different fonts.

Of the British software houses, only Mastertronic was prominent. Its budget Commodore 64 discs, which sell for \$9.99, have done remarkably well since they were launched in the US. Mastertronic launched *Spooks*, *The Captives*, *Finders Keepers* and *Wrath of Magra* for the first time in the US.

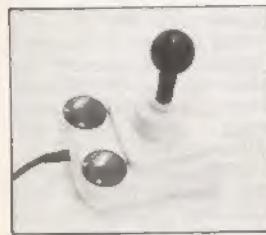
Joysticks Survey

Thirteen of the best, compared. In our first Arcade games special feature, issue, Graham Taylor gets to grips with a selection of the top joysticks available for micro

BBC Pro Joystick

Price £17.95

Supplier Kempston



The BBC Pro Joystick is beautifully designed. You need no additional software and the whole thing can be plugged straight into the analogue port with no need for cumbersome interfaces. It also uses eight-way micro switches to register movement which means it's very sensitive - maybe too much for some games.

The design is sturdy with a metal shaft, fire buttons are large, although the action was maybe a little sloppy - they didn't quite 'feel' like they registered your press. Extensive testing on Acornsoft's *Revs* revealed no major design flaws - the simple ball shaped tip provided a positive non slip grip.

In short an excellent joystick for BBC owners. Quite expensive but, remember, many alternatives also need an interface.

Kempston Formula 1 Joystick

Price £16.95

Supplier Kempston



This is a deluxe version of the Kempston Formula 2.

The main difference is the use of micro switches which makes for better response and greater longevity (they

apparently don't break so easily).

The basic design is the same as the BBC Pro Joystick - strong metal shaft, left and right fire buttons, firm ball grip. As with the BBC there may be some minor doubt about the fire button response - it's not all that firm.

One point that hasn't been skimped - the length of the connecting lead - it's long at five feet and that can be useful. Short leads can get easily twisted up in two-player games and force players to stand close together. £16.95 is not cheap but I don't think it'll need replacing too often.

Kempston Formula 2 Joystick

Price £11.95

Supplier Kempston



The Formula 2 Joystick is Kempston's bottom range item and at £11.95 it's one of the cheapest joysticks around.

It uses leaf switches which have a number of problems associated with them. For one thing the action is very sluggish. To move left you have to shove the whole shaft firmly and far to the left - it takes a noticeable amount of time and on our test program (*Dynamite Dan*) definitely caused valuable lives to be lost. There is a longer term question of reliability. The leaf system works a bit like those metal plate battery connectors, there is a danger that because of oxidation the electrical connection could fail to be made.

Although unlike the Formula 1, you get a top-of-shaft fire button generally the other aspects of design seem cheaper. The shaft is some kind of

nylon-like material rather than metal and the grip, although more like a motorbike throttle, is not necessarily easier to use. As Kempston joysticks go, I'd certainly rather pay the extra five pounds for the Formula 2.

These joysticks are the same overall design as the Flightlink switch-type joystick but use an analogue system and come as a pair both connected to one BBC analogue port connector.

At £17.95 for a pair of joysticks these are obviously very cheap, although I wonder how many games on the BBC have facilities built-in for two joysticks - not many I think.

Analogue systems tend to be unreliable but this one feels good and is surprisingly responsive, although it doesn't re-centre itself automatically.

In fact it's fair to say you could easily believe it was a micro-switch system - Flight Link give it a 300,000 cycles track and wiper life which translated means they expect it to last a long time. Very good value if you need two joysticks (a single analogue joystick costs £9.95).

Flightlink Switch Joystick

Price £11.45

Supplier Flight Link



Flight Link has a range of similarly styled joysticks designed for a range of machines. The basic model has an Atari connector and costs £11.45 - less than the average for switch-type joysticks.

The actual switching is excellent, very responsive indeed and with a reassuring 'click' that sounds like it isn't going to wear out quickly. The fire button also sounds and feels like it could take a lot of strain. What you lose over cheaper joysticks is in design - the shaft is a short metal pipe, topped off with a short piece of plastic. It works perfectly well but isn't elegant. If you don't care about looks, this is one of the best switch-type joysticks available.

Flightlink BBC Joystick (pair)

Price £17.95

Supplier Flight Link



A very cheap analogue joystick that looks pretty good, has a reasonable grip and a pretty good response. The doubts come with long term reliability. We've had one in the Popular office for around six months or so and it's broken - the amount of use it got was too much for it and the switch mechanism gave in.

However, it had to work hard in that time and maybe it was just a dodgy one from the factory.

If you're limited in cash they don't come much cheaper.

Joystick Survey

Vulcan Gunshot Joystick II

Price £11.95

Supplier Vulcan Electronics



The only difference between this joystick and the Gunshot I is the fact that it's black and that it has an auto-fire switch.

Setting auto-fire to on is the same as holding down the fire button continuously. This is fine for your basic blast-'em-up game but not that useful in *Manic Miner*-style games where all that happens is that you bounce around everywhere.

If you are absolutely addicted to games which need lots of laser destruction you might think the extra £3 for the fire switch is worth it. Most people probably won't need it.

The Boss

Price £25.00

Supplier Computer Games



This joystick uses six-way leaf switches rather than micro switches but it responds well.

There may be a few doubts about long-term reliability, partly due to the mechanics of the leaf system and partly because of the construction - the joystick shaft seems to be mainly plastic.

Visually the joystick is neat - smart black and grey colour scheme with a moulded grip. One complaint here, the grip is short and the fire button is mounted on the top. This

means that to operate the fire button the thumb has to be pressed down in a slightly uncomfortable way.

A reasonable mid-range analogue joystick.

Bat Handle Joystick

Price £25.00

Supplier Computer Games



A very high quality joystick using a specially developed left system to register joystick movement.

The Wico leaf system does appear to give the kind of response you'd expect from a micro switch system and is apparently as reliable.

This joystick has a thick metal shaft which re-centres automatically and twin fire buttons. One is top-mounted the other in the base - a switch selects which is in operation.

The design is plain; square base and tapered plastic grip. It looks like it might cause you to slip but in practice it never gave any problems.

A very nice joystick but £28 is a lot compared to a Kempston Micro Switch at £18.

Super Three Way Command Control

Price £27.00

Supplier Computer Games



This is basically the Bat Handle Joystick with a choice of grips - a round handle, a tapered plain grip and your standard ribbed motorcycle-style handle. Changing between grips is simple and each handle fitted firmly. I can't believe that people really need three handles but I suppose the First Division addict may have a use for them.

Super Champ

Price £12.95

Supplier Dean Electronics



Super amount of plastic makes this one good value. It's probably the largest joystick available. That and the matt black colour have given it such macho appeal that it's been the most successful joystick in the US for a while. Although not micro switched it has a tough but flexible ring of plastic between shaft and base that prevents you breaking it easily.

The grip is firm with a fire button mounted both on the top for thumb action and another just below that for first finger - it's very easy to use.

All in all unless you want the extra sensitivity of micro switches this could be the joystick to go for.

CCL Champion

Price £11.99

Supplier Computer Games



This is a budget-price joystick which nevertheless includes stick and base-mounted fire buttons and an auto-fire switch.

The saving is made in the switch design. This uses some sort of leaf system with an action that feels a little doubtful. I can imagine that it might not last very well, but is still good value.

QL Sure Shot

Price £26.95

Supplier Eidersoft



A very high quality device which plugs straight into the QL's serial port.

It uses a very high quality micro switches with a reassuring click when contact is made. It has a plain design with flat rectangular base and a taper-style grip. Fire buttons are mounted left and right on the base and on the top and all have a very good and decisive response.

The shaft is thick metal for durability and generally this looks like a joystick that will last. Highly recommended.

Dean Electronics, Glendale Park, Fernbank Road, Ascot, Berks.

Computer Games Ltd, CGL House, Goldings Hill, Loughton, Essex.

Vulcan Electronics, 200 Brent Street, London.

Flight Link, Unit 12 The Maltings, Turk Street, Alton, Hants.

Kempston Micro Electronics, Singer Way, Woburn Road, Industrial Estate, Kempston Beds MK42 7AF.

Eidersoft, The Office Hall Farm, North Ockenden, Upminster RM14 3QH.

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Complete Arcade

SPECTRUM

Knight Lore ■ Clear 24831 : Restore Gobub 60 : Gobub 60 : Poke 62000,61 : Poke 62178,0 : Poke 62259,201 : Poke 62410,251 : Poke 62411,201 : Randomise USR 62374

■ Poke your routines here or Poke 50567,0 is infinite lives.

30 Print USR 24832

40 Data 82926, 23306, 231, 33, 64, 188, 17, 14, 4, 62, 255, 65, 206, 86, 5, 201

80 Data 41012, 41021, 33, 113, 184, 17, 48, 242, 1, 172, 1, 178

50 Read a,x; For p = a to x : Read d : Poke p,d : Next p : Randomise USR a : Return

Just type in the above and play your original from just past the initial header.

Poke 50064,201 slope metamorphosis

Poke 50203,0 gives infinite days

Poke 49789,x is number of objects needed to collect.

Underworld Use the Knight Lore Program but make these changes:

Line 90 change 41012 to 41008 and 41021 to 41017

Line 30 change to Print USR 26810

Line 20 is Poke 59378,0 for endless lives or Poke 45019,201 removes moving sprites.

Mutant Monty Poke 84800,0 : Poke 84887,0 : Poke 84893,0 : Poke 55321,0 These give infinite lives.

Project Future Poke 27683,0 removes aliens

Cookie Poke 28698,62 : Poke 28698,8 : Poke 28697,0 : Poke 28698,0 endless lives

Pyjamarama To get past the hyperloader type in this routine. It will load the game and then stop it from auto starting:

10 Clear 29999 : Restore 20 For a = 1 to 14

30 Read b : Poke(a+b*28999).b : 40 next a

50 Print "insert game and press play"

60 Randomise USR 30000

70 Poke 32844,207 : Poke 32848,26 : Poke 32828,331 : Poke 32828,301

80 Poke 32789,243 : Poke 33921,0 : 100 Randomise USR 32789 : 120 Stop

Pyjamarama To get past the hyperloader type in this routine. It will load the game and then stop it from auto starting:

10 Clear 29999 : Restore 20 For a = 1 to 14

30 Read b : Poke(a+b*28999).b : 40 next a

50 Print "insert game and press play"

60 Randomise USR 30000

70 Poke 32844,207 : Poke 32848,26 : Poke 32828,331 : Poke 32828,301

80 Poke 32789,243 : Poke 33921,0 : 100 Randomise USR 32789 : 120 Stop

130 Data 221,33,59,127, 17, 216, 1, 62, 255, 63, 205, 86, 5, 201 Once the game has loaded you can enter your pokes. Poke 43883,x is number of lives. To start the game Randomise USR 64649.

Fall Guy Type in the following for infinite lives:

10 Clear 24100 : 11 Load *** code : 12 Randomise USR 65100

13 Load *** code : 14 Poke 44204,0 : 15 Randomise USR 41200

Sky Ranger (Level) Code : (1) enter, (2) map; (3) pilot; (4) stomp; (5) pairs; (6) event; (7) recap; (8) alibi.

Horace and the Spiders Poke 28142,0 - no hills on Level 1

Poke 28713,0 - no spiders on Level 1

Poke 28623,0 - ropes are pulled in last

Poke 28720,0 - jump onto next rope when you like

Poke 30070,0 - all spiders die on Level 3 instantly

Poke 35218,0 - hills and more hills for masochists

Poke 29910,0 - slow spiders on Level 3

Poke 30116,0 - infinite spiders on Level 3

Poke 29828,62 - stops ropes being pulled up on Level 3

Stop the Express before entering the Pokes do the following: Type MERGE "", then press Enter, and press play on your original tape. Type "Clear 25989;Load **" code.

then press Enter, and press play on your original. Stop the tape, then type Poke 48111,201 : Randomise USR 48086, then press Enter. You can now enter your pokes. To run the code type Randomise USR 32768,

Poke 34644,183 : Poke 34926,183 : Poke 35257,0 - endless lives.

Poke 35780,0 : Poke 36948,0 - unlimited time.

Poke 40673,0 : Poke 40674,0 : Poke 49281,N - start carriage number 'N' (Be careful some values may crash game) If it does not work then add: Poke 40075,4

Freeze Seas Poke 34810,0 - infinite lives.

Pr-Balled Poke 44416,x - x is number of lives

Paytron Poke 28633,0 : Poke 28628,0 - endless fuel.

Poke 41098,17 : Poke 41099,32 : Poke 41100,1 : Poke 41101,0 - endless men.

Poke 28143,62 : Poke 28143,255 : Poke 28144,0 - endless oxygen.

Zaxxon Poke 28277,x - where x is the number of lives.

Ah Diddums Poke 24942,x - where x is the number of lives.

Pyramid Poke 44686,0 - timeless energy.

Arcadia Poke 25726,0 - infinite lives.

Zip Zap Poke 53781,0 : Poke 53782,0 : Poke 53753,0 : Poke 54141,0 : Poke 54142,0 : Poke 54143,0 : Poke 54144,0 - infinite energy

Wild West Hero Poke 23821,x - where x is number of lives (32 max).

Mr Wimpy Poke 33893,0 - infinite lives.

Poke 33909,x - where x is number of lives.

Poke 43106,0 - infinite peppers.

Poke 33731,x - where x is number of peppers.

Poke 33501,0 - skip first stage

Mare Death Race Poke 25730,0 : Poke 28731,0 : Poke 26638,0 : Poke 26690,0 : Poke 26771,0 : Poke 26772,0 - works with interface!

Kosmic Kanga Poke 35136,x - where x is the height to jump.

Poke 23944,x - where x is the number of lives.

36212,0 - infinite lives.

Monty Mole Poke 36004,0 - endless lives.

Poke 36301,201 - no crushers.

35874,265 - lets you fall a great height.

Eskimo Eddie Poke 24668,24 : Poke 24667,78 - infinite lives.

Kokotons Will Poke 43742,0 - infinite lives.

Poke 42214,x - where x is the number of lives.

Poke 42177,3 - changes some of the sprites to red, so they don't kill Will.

Lazy Jones Poke 56693,0 - infinite lives.

Spectacle Password : "Everyone's a nervous wreck"

Android Poke 62249,24 : Poke 62250,32 : Poke 53887,0 - infinite lives.

Mutant Monty Poke 54833,0 - gives 236 lives

River Rescue Poke 33420,0 - infinite lives Player 1.

Poke 33432,0 - infinite lives Player 2.

Zaxxon Poke 48282,x - where x is the number of lives.

Son of Blagger Merger the loader and delete Lines 70, 80, 81, 82, 90 Insert Line 46. Poke 27278,0. The above Poke will give you a hacker menu (All routines).

Gilligan's Gold Poke 52820,0 : Poke 52821,0 : Poke 52822,0 : Poke 52833,0 - unlimited lives.

Finders Keepers Poke 34282,0 - infinite lives.

Poke 30384,x - where x is the number of lives.

Fred First type LOAD "" CODE 25384, press Enter then press play on your original. When loaded enter, SAVE "FRED" CODE 34500, 23650 Press Enter and save this on a blank tape. Rewind your tape, then type LOAD "" CODE 24500. Press enter and play on your new tape. Enter your pokes, then to run the code enter, RANDOMIZE VSR 30363.

Poke 31178,0 - this will make the last unit of power last forever.

Poke 31894,X : Poke 31892,X. Poke 44696,X - where X is the number of power units (max 240)

Sir Lancelot 10 Input "no. of lives": X 20 For A = 50000 to 50024

30 Read B = Poke A,B 40 Next A

50 DATA 10, 125, 91, 231, 31, 128, 91, 17, 128, 36, 63, 103, 89, 205, 85, 243, 62, X, 50, 38, 82, 196, 8, 93

60 CLS 70 Print "Load Main Headless Block"

80 RANDOMIZE USR 50000

Forward your tape until the main headless block, then run the above program, when you see the message, press play on the tape, this will give you X lives.

Chuckie Egg First type: MERGE ""

Poke 24501,185 : Goto 1 Then press play on your original, the game will load normally, but when loaded you will see the

Complete Arcade

Hunchback	Poke 24760,255 for endless lives or try Poke 26888,0	Lunar Jetman	Poke 36964,244 : 36965,3 - infinite lives Poke 43117,x - where x is no. of lives	Expert	Poke 21876,173 : Poke 21872,173 (infinite lives)
Mugsty	Poke 43012,0 : Poke 43906,0		Poke 37899,201 - no enemy		Poke 20400,168 : Poke 20401,0 Poke 20402,234 disables collision detection
Zoom	Poke 24743,0 : Poke 32882,0 - infinite lives		Poke 43082,x-1 - where x is level (x < 99)		
Ground Attack	Poke 36212,0 - endless lives	Trans Am	Poke 25446,0 - infinite lives	Power	Poke 24964,0 - infinite lives
Horse Cross Skating	Poke 30027,0 : Poke 30644,0 - no ski charge Poke 28008,0 : Poke 29048,0 - No cars on 'bogger' stage Poke 30762,0 - No ambulance fee	Backpackers Guide to the Universe	To make a print-out of the guide on ZX or Alphacom printer 1 Clear 63335: Load *** Screens 2 Paper Out0 3 Prints 10,0; 4 Load *** Code 5 For x is 29183 to 38196 Read x: Poke x,x: Next x 5 Poke 29160,21 7 Date 82, 127, 219, 254, 230, 1, 194, 215, 113, 308, 172, 14, 166, 215, 113 ■ Randomize USR 20126 Now load guide. Press Space for a copy	Bounty Bob Strikes Back	On level 1 after getting coffee pot type 8 and press F7 to go to level 8 after getting flower pot type 1 and press F7 to go to level 4 on level 11 after getting pitchfork type, and hit F7 to go to level 14
Jack & Beanstalk	Poke 86110,0	Boulderdash	On cave E go all round perimeter then under gem boxes, wait until firefly is going up, then follow, wait till top until both Bradys are gone, then get gems and retreat	Super Gridder	To make grid invisible until run over: When loaded press Run/Stop - Remore then type SYS 4524
Giant's Revenge	10 Clear 24249: Poke 23805,115 : Poke 23807,246 20 Load *** Screens: Load *** Code 25 Poke 24504,0 30 Randomise USR 24460	Hunchback	Poke 26888,0 - infinite lives Poke 24760,x - where x is number of lives	Turbo Nag	Poke 34202,200 makes complete game easier
Sabre Wulf	Merge header, Type Poke 23166,1 : Clear 88836 Edit the line and delete the Print USR 23424 Add line 10 that includes your pokes. Add line 20 Print USR 23424. Poke 43878,255 - I player infinite lives Poke 46520,255 - 2 player lives Poke 45500,x - Number of lives Poke 41728,255 - No limit on gained lives Poke 44929,0 - ; disable beddes, so they only appear when the fire button is being pressed To get an object stand on it and press fire . Poke 44788,0 - indestructable Sabremain Poke 45001,0 41011,0 : Poke 31802,0 : 48960,0 - stay blue, super fast and no monsters Poke 39702,30 - gets rid of materializing monsters Poke 44688,188 - 44676,255 - 44677,80 - permanently cyan	Moon Alert	Poke 42854,186 - infinite lives Poke 42249,24 - stops time decreasing Poke 42855,252895,2 - keeps scrolling fast (whole screen) Poke 4304,x - where x is the number of lives (14 max) Poke 39754,0 - endless lives Poke 37035,201 - no enemies Poke 38113,256 - move left at 100 mph Poke 28371,28007 - hi score table	Booty	Hold down keys K,E,V,I,N till the same time for chat mode with unlimited lives
		Defends	Poke 37531,0 - infinite lives Poke 34183,0 - infinite smart bombs Poke 35730,x - where x is the number of lives	Airwolf	When route is blocked by spinning ball when you rescue third scientist move it by shooting two vehicles at cave bottom - shoot it before it floats to the ground.
		Tutankhamun	Poke 27783,0 - infinite lives	Entombed	Try whipping anything that blocks an exit.
		Zoom	Poke 24743,0 - infinite lives Poke 25131,x - where x is the number of lives	Spy vs Spy	On one player game, wait in airport room, booby trap doors, when the computer has objects he will be killed getting to the airport - get objects and leave.
		Ant Ant	Poke 36519,0 - infinite lives Poke 36363,0 : Poke 36362,0 - stops energy drains Poke 36871,0 : Poke 36092,0 - Poke 37289,175 : Poke 37260,175 - makes doors open more frequently	Zaxxon	To make ship indestructable simply type Red before starting the game.
				Attack of the Mutant Gamals	Load first part without running it (type Verify and then Return) Load second part by typing Load "",,1 and enter Poke 11839,258 SYS 4098 you now have unlimited lives.

COMMODORE 64

Due to the number of pokes/tips we received it is impossible to ensure that every one works; we have done our best to check as many as possible but cannot guarantee the results.

Addicts Guide

then push forward the joystick - the jump technique I used in other blocked doors will get you through.

VIC 20

Portals of Willy
Load game. Press CTRL Q and RESTORE
Lives = Poke 111373,200 No chars disappearing - Poke 11260,234 Poke 11388,234 Start screen Poke 11378,(x 0 to 31) Restart game with SYS 12269

AMSTRAD

Pyramids 10 Memory B191
20 Load ***
30 Poke 16087,0
50 Call 8192
Replace the header with this to get infinite lives

Roland Goes Digging 10 Memory 17000
20 Load "",17800
30 Poke 17878,0
40 Call 18659

Defend Or Die 10 A3H
■ Load "Defend or Die"
30 Poke &4e4,&90 : Rem lives
40 Poke &4e8,&99 : Rem smart bombs
■ Call &4025

Karl's Treasure Hunt ■ Memory 12288
30 for f 1 to 3: Load "",next
30 Poke 38102,bves
40 Call 38664

Roland in the caves Press CTRL G to exit a level at any time Shift + A goes to next screen with 100000 pts.

Bagger Poke 3281,x, x is lives less than 240
Poke 31038,0 : Poke 31940,0 together disable the conveyor so that they act like dry land.
Poke 32878,0 : Poke 32580,0 drop from any height
In demo mode find the start screen you want and press "ADGJL" simultaneously - now start as normal and you will begin on your chosen screen.

Roland In Time Type Memory 4888
Load "Routine", 5000
When loaded Poke 8850,167 (endless lives)
To run it Call 5000

Electro Freddy ■ Memory 10000
20 Load "A1", Load ""
Load "", Load "", Load ""

30 Poke 39356,285
40 Call 38323

Punchy

10 Memory &1FFF
20 Load "code"
30 Poke A20A9,255
40 Call &2000

Roland on the Ropes

10 Memory 4800
20 Load "Roland.d"
30 Load "Roland.c"
40 Poke &2804,0; Poke 2552,0 (minus address)
50 Call 41100

Manic Miner

Poke &FBFD,x is lives
Poke &FA80,0 endless lives
poke 77401,24 switch screens by pressing ESC
Poke &7310,0 drop from any height
Poke &7311,0 stops air running out

Football Manager

Break in and Goto 5213 to win the cup Goto B170 if in the top three will earn your success money

Jesse Willy

10 mode 1
20 memory &7ed
30 Load ""
40 For n = 170 to 244
80 Read #8
80 Poke n,VAL("S">#8)
70 Next
80 cls
90 call 170
100 Data 3E,C9,32,B0,81,
21,00,80,11,01,80,01,06,
09,36,00,ED,BO,CD,EE,
7F,01,00,15,21,30,30,
22,78,AF,C3,21,SD,A7,
110 Data CD,53,AF,7B,
58,87,87,47,7B,C6,05,
16,08,AF,05,F2,C8,00,
3E,7F,32,EE,81,C3,4A,
AC

Hunchback

■ Border 0: Ink 0,0: unk 1, unk 2, unk 3,25
20 Ent 1,100,2,2
30 Ent 2,90,-8,2
40 Ent 12,10,-2,10
50 Pen 2
■ Memory &38FT
70 Load "Hun 3",&4C00
80 Poke &61FB,1
90 Poke &61F9,1
100 Poke &61FB,+18,1
110 Poke &61FB,+19,1
120 Poke &61FB,+28,1
130 Poke &61FB,+27,1
140 Poke 20762,0
150 Call &45431

Android 1

Infinite lives: Poke 48391, &937A, &939F and &93A0

30 Ober

10 Memory &1FFF
20 Load "code"
30 Poke A20A9,255
40 Call &2000

lives!

Let the whole game load, then press "CTRL - Break" then type PAGE = &1700 < < RETURN > > OLD < < RETURN > >
:LIST2900 < < RE TURN > > Change MEN% from Z to the number of lives you want:

Castle Quest

To get out of jail, take the stool, jump and throw it at the torch, take the stool and torch and get to the top of the door, throw torch on bed and jump past guard when he rushes in

Cylon Attack

Speed up game with ?&TE45 = 21-&TE46 30 (CR) - this also works for Chuckie Egg

Snapper

For extra lives. Chain " " Snapper as usual but when "snap?" has finished loaded press Escape and enter: 45&FDD = &7F and then Run

Elite

To make a lot of cash trade computers from rich industrial planets to poor agricultural. If attacked by a low ship follow one slowly. The pattern of evasive manouevres will save you

Frik

*Load the last part of the game then type ?&305B = &F for infinite lives or ?&304DD 1 so that the escape key changes levels Call &498A to start game

QL

Invaders Add shooting sound. 100 For n = 0 to 36 Step w 110 If n > 30 Then R 240 Elev R = ■ : 2 120 BEEP 1500,N,R,15,2,0,1

ELECTRON

Zalanga Load the first program with LOAD "Zalanga" and type PROCpugwash. The Electron will play the Pugwash theme tune with two voices

DRAGON

Hungry Horace To get high scores got to bell and stay there till it stops ringing.

Ninja Warrior Load game as normal but before typing EXEC type Poke 94B9,n, n is lives 1 to 255

Planet Invasion As above but Poke 7438,n n is 1 to 18 - larger values cause a crash

Skrambis Shop...
Poke 32761,&1E2E
Poke 32763,&H04
Poke 32763,&1C0
Poke 32764,&HBD
Poke 32765,&HB7
Poke 32768,&H5B
Poke 32767,&H3R
Exec 32761
Toke &H1C7E, (player 1 lives)
Poke &H1C84, (player 3 lives)
Exec 4056

Whirley Bird Poke &H2078, lives Run Poke &H2073, stage

Lunar Rover Poke &H8728, lives Patrol

ATARI

Diamonds

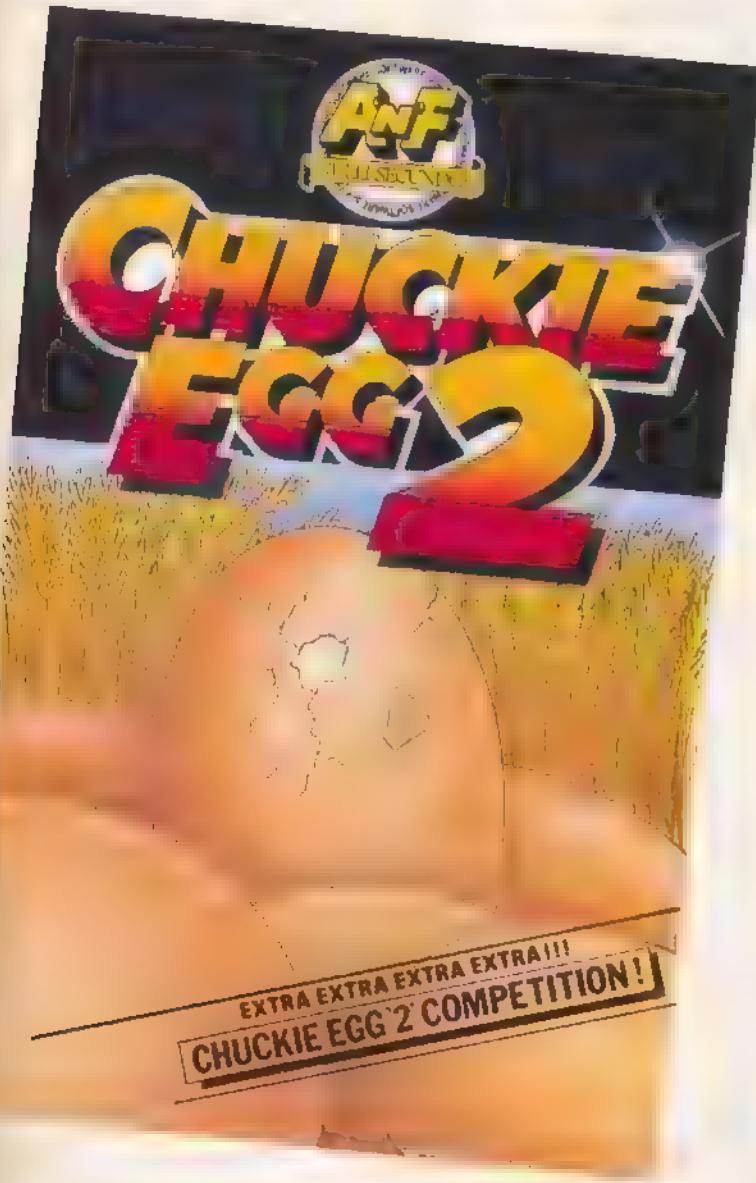
Poke B,0,Poke 744,16
x = user(40960)
Now enter and run this 10 restore 1000 : for x=0 to 23 : read in: poke 180 : x=x+next x
1000 data 159,96,141,39,
8,32,B,6,169,79,141,60,
21,169,88,141,81,21,169,
21,141,82,21,76,98,10
2000 end
Now put diamonds in the tape recorder, type x = user(52404) and press return.
press z after the bleep and start tape.
when the title page appears you have 1.5 seconds to press the system reset.
Now type x = user(1280); the rest of the game will load.
If you don't have a disc system don't load the dos before using this routine.

BBC

Mr EE

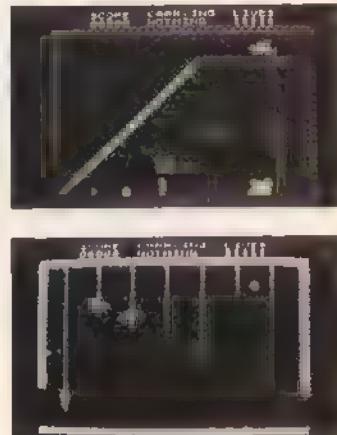
After the page has loaded, press Break, type *load "MREE", L900 < < Return > > ?&1EBC8 < < RE TURN > > Then type CASS&4300 < < RE TURN > > (infinite

A great NEW game from A&F.



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Not only does Harry have to collect the ingredients to mix the eggs, but he will also have to collect the parts for the toys that go inside the eggs.

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Laser Cycles

For our Arcade issue, what better than a machine code implementation of the classic game Light Cycle on the BBC B by Jeremy Thornton?

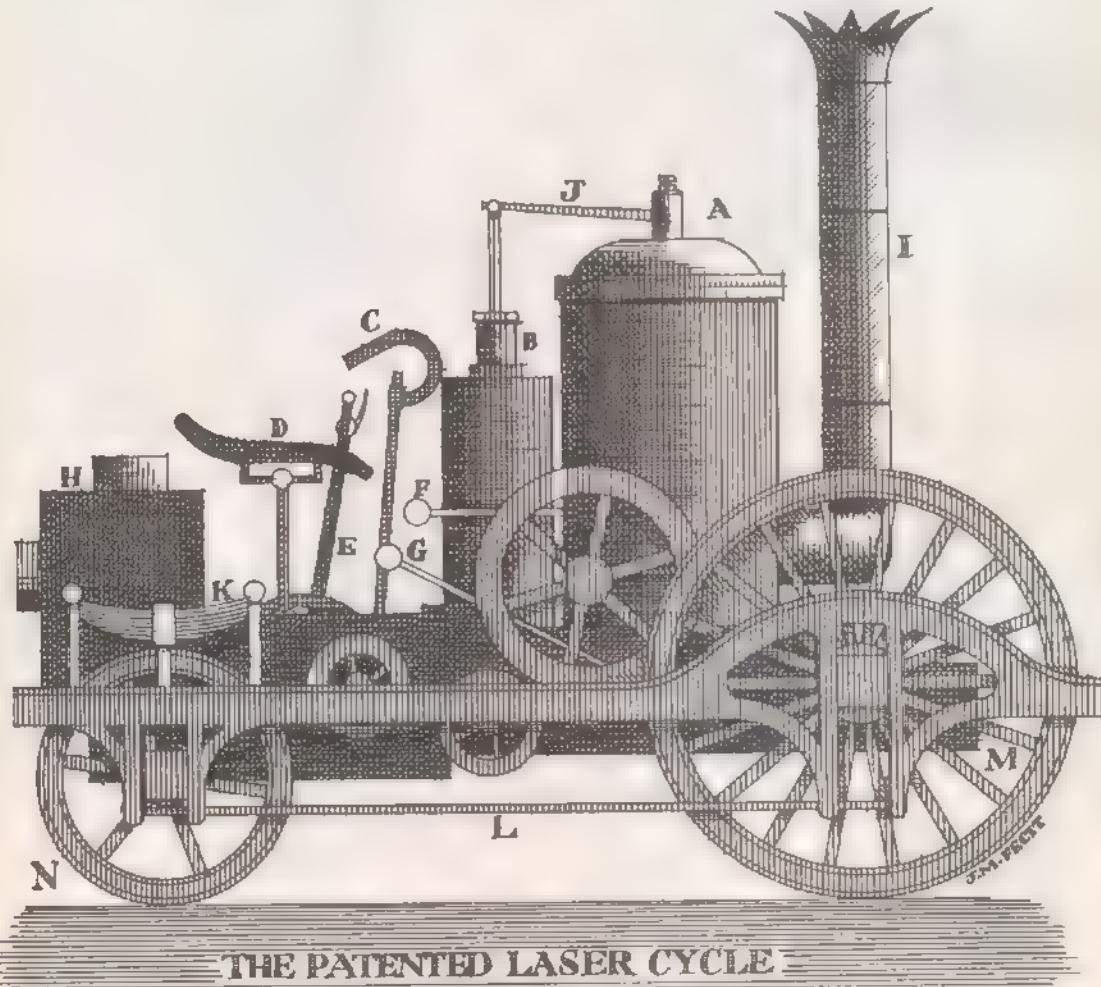
The object of the game is to guide your laser cycle around the screen and to box in your opponent with the trail that you leave behind. Colliding with either your trail, your opponents trail or the wall will cause your destruction! It is either a two player game or you can challenge the computer.

The game itself was written in assembly language with the user interaction at the beginning and end being handled by the Basic. The machine code itself occupies less than half a K, in fact only 440 bytes. It is located just below the model screen between &2CD0 and &2E88.

The small piece of code at the beginning, between &0C09 and &0C1E is an

interrupt routine which intercepts the operating systems and if a key has been pressed stores it before returning it to the O.S. routine at &DC93.

When a key is pressed its specific code is stored in &EC, the previous number being pushed into &ED. In this way the keys used can be changed by altering the data at Line 2980.



THE PATENTED LASER CYCLE

10REmark Laser
 Cycles by Jeremy
 S. Thornton
 20FORpass%=OTO
 2STEP2:PZ=&C09
 30!OPTpassX
 40PFA
 50TXA
 60PFA
 70TYA
 80PFA
 90_LDA&EC
 100STA&6E
 110LDA&D
 120STA&GF
 130PLA
 140TAY
 150PLA
 160TAX
 170PLA
 180JMP&DC93
 190RTS:1NEXT
 200sword=&FFF1
 1sourch=&FFEE
 210FORpassX=OTO
 2STEP2:PZ=&CEO
 220!OPTpassX
 230.output
 240 LDV@0:.loop
 250LD@(&70),Y
 260JSRdsrch
 270INY
 280CPY#9
 290BNEloop1
 300LD@&99
 310BEQ!fast
 320JSRdelay
 330.fast
 340LD@&79
 350BNEdead
 360BNEalive
 370.dead:RTS
 380.alive
 390LD@&7F
 400BNEcomapp
 410JSR1input
 420JMPoutput
 430.comapp
 440JSRplayer
 450JMPoutput
 460.player
 470LD@&7C
 480BNElogi
 490JMPinput
 500.logic
 510LD@&D08
 520STA&89
 530LD@&D07
 540STA&8A
 550LD@&D08
 560STA&88
 570LD@&D09
 580STA&BC
 590LD@&7D
 600STY&7E
 610LDA(&72),Y
 620JSRkeys
 630LD@&79
 640BNEchi
 650JSR1ia
 660LD@&75
 670BEQ!okay
 680.ch1
 690LD@&89
 700STA&D08
 710LD@&8A
 720STA&D07
 730LD@&88
 740STA&D08
 750LD@&8C
 760STA&D09
 770LDY&7E
 780LD@&BF, Y
 790STA&7D
 800TAY
 810LDA(&72),Y
 820JSRkeys
 830LDA&79
 840JSRch2
 850JSR1ia
 860LDA&75
 880.ch2
 890LDA&89
 900STA&D06
 910LDA&8A
 920STA&D07
 930LDA&8B
 940STA&D08
 950LDA&8C
 960STA&D09
 970LDY&7E
 980LDA&C03,Y
 990STA&7D
 1000TAY
 1010LD@(&72),Y
 1020JSRkeys
 1030.okay
 1040JSRsound
 1050JSRnext
 1060RTS
 1070.input
 1080LD@&2: .loop
 1090LD@&BD, X
 1100 LDY@4:.loop
 110.out
 1110CMP(&72),Y
 1120BEQout
 1130DEY
 1140BNEloop2
 1150INDEX:BNEloop
 1160BEQover
 1170.out
 1180LD@&7C
 1190STA&74,X
 1200 .ovr
 1210LD@&7C
 1220LDA&74,X
 1230JSRkeys
 1240JSRsound
 1250JSRnext
 1260RTS
 1270.next
 1280LDA&7C
 1290EOR#11
 1300STA&7C
 1310LDA&70
 1320EOR#10
 1330STA&70
 1340LDA&72
 1350EOR#60
 1360STA&72
 1370LDA&77
 1380EOR#22
 1390STA&77
 1400LDA&7A
 1410EOR#9
 1420STA&7A
 1430RTS
 1440.keys
 1450.a: LDY@4
 1460CMP(&72),Y
 1470BNEbr
 1480LDY@0
 1490JSRaddition
 1500.b: DEY
 1510CMP(&72),Y
 1520BNEc
 1530LDY@0
 1540JSRsubtract
 1550.c: DEY
 1560CMP(&72),Y
 1570BNEd
 1580LDY@2
 1590JSRaddition
 1600.d: DEY
 1610CMP(&72),Y
 1620BNEf
 1630LDY@2
 1640JSRsubtract
 1650.fin
 1660RTS:1NEXT
 1670.addition
 1680LDA(&77),Y
 1690CLC
 1700ADC#4
 1710STA(&77),Y
 1720IMY
 1730LDA(&77),Y
 1740ADC#0
 1750STA(&77),Y
 1760JSRcheck
 1770RTS
 1780.subtract
 1790LDA(&77),Y
 1800SEC
 1810SBC#4
 1820STA(&77),Y
 1830INY
 1840LDA(&77),Y
 1850SBC#0
 1860STA(&77),Y
 1870JSRcheck
 1880RTS
 1890.sound
 1900LD@&7A
 1910LDY@8
 1920LD@#87
 1930JSRreward
 1940LDY@4
 1950STA(&7A),Y
 1960LD@#80
 1970EOR(&7A),Y
 1980LDY@4
 1990STA(&7A),Y
 2000RTS
 2010.check
 2020LD@&77
 2030LDY@78
 2040LD@#9
 2050JSRreward
 210LD@&D07
 2110LD@#40
 2120STA&75
 2130LD@&D07
 2140CM#81
 2150BNEbr
 2160LD@&D06
 2170CM#80
 2180BNEbr
 2190INC#75
 2200RTS
 2210.br1
 2220LD@&D07
 2230CM#85
 2240BNEbr2
 2250LD@&D06
 2260CM#84
 2270BNEbr2
 2280INC#75
 2290RTS
 2300.br2
 2310LD@&D09
 2320CM#63
 2330BNEbr3
 2340LD@&D08
 2350CM#82
 2360BNEbr3
 2370INC#73
 2380RTS
 2390.br3
 2400LD@&D09
 2410CM#87
 2420BNEbr4
 2430LD@&D08
 2440CM#86
 2450BNEbr4
 2460INC#75
 2470.br4
 2480RTS
 2490.delay
 2500LD@&99
 2510.4loop1
 2520LDY@128
 2530.4loop2
 2540CM#8
 2550DEY
 2560BNEloop2
 2570DEX
 2580BNEloop1
 2590RTS
 2600RTS:1NEXT
 2610T@204+9?&2
 05=%C
 2620ENVELOPE1,3,0,0,0,0,0,0,121,-10,-5,
 -2,120,120:f=0
 2630MODE7:VDU141:PRINTSPC(10)"LASER CY
 CLES":VDU141:PRINTSPC(10)"LASER CYCLES"
 2640PRINTTAB(4,3)"Will you challenge t
 he computer(1) or another human(2)
 ?"
 2650REPEAT:gX=GET:IFgX=49 OR gX=50 UNTI
 L1 ELSE UNTIL
 2660IFgX=50 &?F=0:PRINT"Red bike:UP=1
 DOWN=Q LEFT=Z RIGHT=X":PRINT"Blue
 bike:UP=: DOWN=[LEFT=> RIGHT=?"
 2670IFgX=49 &?F=1:PRINT"Blue bike:UP=
 ; DOWN=I LEFT=> RIGHT=?":REPEAT:INPUT
 ""Enter difficulty factor 1-10 easy-ha
 rd " :F1:IF F1>10 OR F1<1 UNTIL0
 2675!%=10-1%:F1=F1+4
 2690REPEAT:INPUT"Enter speed factor 1-
 10 slow-fast " :F2:IF F2<1 OR F2>
 10 UNTIL0
 2700UNTIL1:&99=10-s%
 2710PRINT"SPC(10)Press SPACE":REPEA
 TUNTILGET=32
 2720F%=?0%=?REPEAT:MODE1
 2730PROCinit
 2740VDU19,0,7,0,0,0,19,3,5
 ,0,0,0
 2750GCOLO.3:FORYX=OTO1024STEP20:MOVE10,
 Y%-20:DRAW10,Y%:DRAW0, Y%:MOVE1270,Y%-20:
 DRAW1270,Y%:DRAW1280,Y%:MOVE10,Y%:NEXT
 2760FORXX=OTO1280STEP20:MOVEXX-20,10:DR
 AWXX,10:DRAWXX,0:MOVEXX-20,1000:DRAWXX,1
 000:DRAWXX,1020:MOVEXX,10:NEXT
 2770CALL&2CEO
 2780SOUND0,1.5,100:FORIX=0TO15:VDU19,0,
 IX,0,0,0:NEXT:VDU19,0,7,0,0,0
 2790IF?&70=1:COLOUR1:PRINTTAB(8,10)"Red
 warrior is the victor":rX=rX+1:ELSECOLOU
 R2:PRINTTAB(8,10)"Blue warrior is the vi
 ctor":bX=bX+1
 2800COLOUR1:PRINT"SPC(8)"RED":rX,:COLO
 UR2:PRINTSPC(8)"BLUE":bX
 2810TIME=0:REPEATUNTILTIME>200
 2820COLOUR3:PRINTSPC(4)"Another contest
 ?":IFX15,1
 2830G=GET
 2840IFG>70 PROCinit:UNTIL0
 2850!FrX>bX COLOUR1:PRINT" Red warri
 or is triumphant!"
 2860!FrX<bX COLOUR2:PRINT" Blue warri
 or is triumphant!"
 2870!FrX=bX PRINTSPC(9)"Contest is a dr
 am"
 2880END
 2890DEFPROCinit
 2900RESTORE2980
 2910FORIX=0TO19:READ?(&D01+1%):NEXT
 2920FORIX=0TO7:READ?(&D20+1%):NEXT
 2930FORIX=0TO17:READ?(&D30+1%):NEXT
 2940FORIX=0TO14:READ?(&D70+1%):NEXT
 2950FORIX=0TO7:READ?(&C00+1%):NEXT
 2960FORIX=0TO7:READ?(&B80+1%):NEXT
 2970?&D=RND(4):?&80=?&80+fX:?&82=?&82+
 fX:?&84=?&84-fX:?&86=?&86-fX
 2980DATA18,0,1,25,69,127,2,128,1,0,18,0
 ,2,25,69,128,2,128,2,0
 2990DATA144,176,225,194,184,248,231,232
 3000DATA0,0,&F8,&F7,4,0,0,0,1,0,0,0,F5,&
 F4,5,0,0,0,1
 3010DATA&OB,&OD,&23,&D,248,194,0,&10,E
 OD,0,&39,&D,0,3,3
 3020DATA3,4,2,1,4,3,1,2
 3030DATA11,0,B,0,227,4,232,3
 3040ENDPROC

First ADA

Program The ADA Training Course Price £49.99 Micro Commodore 64 (+ Disc Drive) Supplier First Software, Unit 20B, Horseshoe Road, Pangbourne, Berks.

There are said to be people who have never heard of ADA. There are also said to be people who wished that they never had.

ADA is the language officially adopted by NATO for use on all real-time systems for the 1980s and beyond, such as command and control systems, communications, and automatic defence.

One of the major problems with ADA is that although most of it has been defined on paper the language is very difficult to implement on existing hardware. In fact the only full implementations of the vital ADA compiler are test versions on very powerful and very secret mainframes.

So, an ADA compiler on the Commodore 64 was not the sort of package I ever expected to see. Who would even think of writing a compiler for a 64K micro when the big boys are having trouble getting it on a mainframe? Volker Sasse of Data Becker (West Germany), that's who... and he's done a good job too.

The software consists of an editor to write the ADA programs, a three-stage compiler (actually two programs) which converts the ADA into assembler language, an assembler for final conversion of the program into machine code, and a disassembler. Both the assembler and disassembler are stand-alone utilities which you can also use for your non-ADA efforts.

As an introduction to the language part of ADA the package works very well. The manual is written clearly, in the main, and takes you step by step through the use of the ADA editor and compiler whilst also guiding you on your first steps into the intricacies of ADA itself. However, although ADA is potentially a very powerful language it is also very complex and the ADA Training Course (translated from the original Ger-

```

18 with TEXT_IO; use TEXT_IO; -- Chain with I/O routines
29 with CMM_641 use CMM_641; -- and special CMM routines
30 procedure ADA is
31   NUMBER : FLOAT; -- Declare variables to be
32   N_CALC : FLOAT; -- used in program
33   TMP_1, TMP_2, TMP_3, TMP_4 : FLOAT; -- Start ADA routine
34 begin
35   SCREEN_CLR; -- Clear screen
36   for N in 1..1000 loop -- Start loop
37     NUMBER := FLOAT (N); -- Transfer integer to real
38     if N < 501 then -- Perform calculation
39       TMP_1 := NUMBER * 5;
40       TMP_1 := 5000; -- Print NUMBER and N_CALC
41       TMP_2 := NUMBER + TMP_1; -- N_CALC:=INT(TMP_1)
42       TMP_3 := LOG (NUMBER); -- NUMBER<LOG(NUMBER);
43       TMP_4 := TMP_2 * TMP_3; -- TMP_4:=INT (TMP_4);
44       N_CALC := INT (TMP_4);
45       NEW_LINES;
46       PUT (N);
47       PUT (*);
48       PUT (N_CALC);
49     end loop REPT; -- End of loop
50   SCREEN CLR;
51   PUT ("FINISHES"); -- End
52 end ADA;

```

man by First Software) falls short of explaining many of the principles of ADA. It tends to concentrate on the workings of the compiler itself. You would be well advised to get hold of an ADA text book as well.

Listed here is an example ADA program which goes round a loop 1000 times and performs one of two simple calculations each time round, printing as it goes.

Note that the individual expressions used are very simple, the compiler cannot even multiply three numbers together in one go. Also note the rather weird form required for line 120. The final compiled program runs rather a little more quickly than a comparable Basic one, though. It is not a particularly good improvement for what is in effect a machine-code program, especially when the Basic program can be optimised to perform the same function in around 95 seconds.

To be fair on ADA though it

Joust a minute

Program Sir Lancelot Micro CPC 464 Price £8.95 Supplier Melbourne House, Castle Yard House, Castle Yard, Richmond TW10 6TF.

The biggest thing Sir Lancelot had going for it on the Spectrum was that it ran in 16K, which was great news for the people who hadn't been driven to upgrade by a dearth of software. It was also very well done, even if the sheer num-

ber of platform games tended to make you cringe at the thought of another.

On the CPC the question of memory is irrelevant, but the fact that it is still well programmed isn't. There is not, as yet, the mind-numbing quantity of such games released for the Amstrad machines and Lancelot is one of the most enjoyable I have played.

The movement and animation are extremely fast and smooth and, despite being in 16 colour mode the graphics avoid looking crude and chunky. All your extra lives

are seen dancing at the bottom of the screen, as in *Manic Miner*, but as each of these is killed off the speed of the remaining sprites increases dramatically, so that by the last life everything on screen is going positively berserk, a bit like old *Space Invaders* games.

There are 24 screens, each of which can be reached directly from screen 1, which will be a very welcome feature for those who are not adept at such games. The only drawback is that, whilst attractive on the colour monitor, it is unplayable on the green screen because of invisible objects, colour clashing etc. This forces you to try and get some time using the TV - a nightmare I'm sure all Amstrad owners are very glad to have left behind.

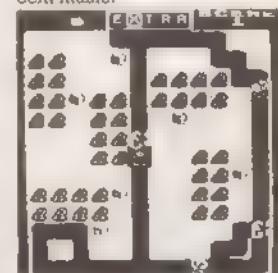
Tony Kendle



Eeba gum!

Program Mr EE Price £8.95 Micro BBC B Supplier Micro Power Ltd, Sheepscar House, Sheepscar Street South, Leeds LS7 1AD.

Micro Power have another hit game on their hands - why? Because it's an arcade game that's neither impossible to learn nor so easy you leave the cat to play after the first ten minutes - and it has decent music!



True it seems tricky when you read the instructions, but in fact you have to run your character around the screen to eat cherries while avoiding the bad guys or arranging for apples to fall on their heads. (There's nothing dramatically new in the game - Pac-Man's offspring are everywhere.) You can develop simple, ef-

fective strategies after a few plays. There are - they tell us - ten screens and you can choose to play for a high score or to zip through all the screens at high speed. Sadly there's no hall of fame ■ allow you ■ battle with other scores or other people.

You can use keys or joy-

sticks, the sound can be turned off if it drives everyone mad and you can pause to answer the phone. All in all good fun, good value and just the thing to work off energy after the exams.

Dave Watson



Heads win

Program Operation Caretaker **Price** £9.95 **Micro Spectrum/Amstrad Supplier** Global Software, 33 Shelgate Road, London SW11 1BA.

A azimuth adjustment - altering the tape-head alignment to improve leading - seems to be the in thing at the moment.

Following Interceptor's release for the Amstrad a short while ago is this package released by Global.

In the package you get an azimuth adjustment tape, a screwdriver and a head cleaning tape. Unlike the Interceptor product there is no free game with the package.

Whilst the logic of the package for Amstrad owners is obvious, indeed essential, I immediately snickered ■ the idea of a package being released for other machines since they do not have standard tapes and there was no guarantee that the screwdriver would fit at all.

However, I was more impressed when I found that it fitted all five recorders I have access to.

Even if you are unlucky and have to find a screwdriver that fits your deck yourself the software is worth having. The system it uses seems more straightforward than Interceptor's. Instead of having pointers laid out over the tape deck which tell you the extreme angles of the tolerance of the head, Global's package produces a bar chart on screen that tells you when the reading is good or poor. They do admit, though, that for that final 5% accuracy some sort of pointer should be used as well.

The most important point is that I was absolutely stunned by the improvement ■ produced - almost all the blasted turbo loaders I couldn't get to work went in first time - and as an added bonus, your hi-fi will never sound better.

I regard ■ as an essential purchase. Tony Kendle



Barrels

Program Gatecrasher **Micro CPC 484 Price** £9.95 **Supplier** Amssoft, Brentwood House, 169 Kings Road, Brentwood, Essex, CM14 4EF.

This is a conversion of a game released by Quicksilver for almost every machine that was around at the time. It is more of a logic testing game than one requiring quick reflexes.



The object is to roll barrels down various holes in the

ground so that they follow the ledges and gates and arrive in containers at the bottom.

The idea ■ to fill the nine boxes with one barrel each, although the objectives get more complex as the game progresses. The game therefore relies on you choosing the correct hole ■ let your barrel off.

As it hits one of the gates the gate spins to face in a different direction, causing subsequent barrels to rebound in different ways. You can scroll the ledges in an attempt to make things connect in the way you want, or if things are really hopeless you can cause an earthquake that can disturb all the gates.

It's an easier game to play, or at least to get into, than it is to describe. It becomes very much a 'just one more go' or 'I'll just finish this screen' session and you could easily sit up until the small hours with it. A refreshingly original game.

Dancin'

Program Chemo Blaster **Price** £8.95 **Micro Commodore 64 Supplier** Virgin Games Ltd., 2-4 Vernon Yard, 119 Portobello Road, London W11 2DX.

Virgin's latest release, *Chemo Blaster*, is just what you would expect from one of the country's leading record companies - a game based on music.

All the action revolves around Rockin' Rodney and his "powerful playback" ghetto blaster. He has got himself a job as messenger for the record company Interdisc. On this particular day, he has to collect ten demo-tapes from around the town and deliver them to Interdisc's main office on

Funky Street. It's also part of Rodney's job to "turn the locals on" to his sounds and get them dancing. There's a map included with the instructions showing all the streets in Funkytown and believe me, it comes in very useful. While Rodney patrols the streets he has to avoid some pretty mean dudes like the tone-deaf walkers and the gangsters of the groove.

The main feature of this program is the funky soundtrack with its twelve separate tunes, which is certainly very good. The thing that caught my eye was the layout and presentation of the game. Both were excellent. However, I'm no so sure about the 'lastability' of *Ghetto Blaster*. Still, it's an original idea for a game.

Tom Hussey



tony kendle

Assassin

Program Assassin **Price** £9.95 cassette, £11.95 disc - 40 or 80 track. **Micro BBC Supplier** Robico Software, 3 Fairland Close, Llantrisant, Mid-Glamorgan CF7 8QH.

How good it ■ to find an adventure game with style and quality. Robico produce some nifty numbers and *Assassin* is first rate.

It is a text adventure in which you play Nick Hanson, special agent, and your first task is to discover your task!

As you travel through a beautifully described landscape starting in a decaying railway station, you receive instructions in a variety of ways. You're always in danger of being bumped off yourself - so it pays to be careful and quick.

The text compression system is efficient and the game understands quite tricky commands. You can combine two commands in one sentence - an advance most adventurers will appreciate. Sensible options include coloured text or b/w, a chance to save the game and a helpful command list.

Best of all there's no sense of being cheated... unlike other adventures where random chances and downright perversity often rule.

Jan Watterson



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POPULAR COMPUTING WEEKLY

Play the market

Just in case you haven't sold those BT shares yet, try this microdrive based program by Peter Shaw

This Share Portfolio was primarily designed for those people who, like myself, purchased British Telecom shares and wanted to record and subsequently display graphically how they were doing in the Stock Market. However, it can be used to retain information of up to 15 other shares, if required.

A description of the various Menu Options is as follows: *Option One* captures basic information regarding the share, ie, Name of share (limited to 15 characters). Purchase price. Date when purchased. "High" and "Low" price with associated dates. Number of shares purchased and a share reference to be subsequently used for loading and saving share detail. *Option Two* is a Data Entry Module, where you are requested to answer questions: Share Price and Date of Share Price. If the share price is either higher or lower than either of the ones previously recorded, the display will be updated and the new "High/Low" values with their associated dates will be recorded. In order to see how your shares are faring, it will also display the current Gross Profit/Loss, after entry of the price.

Option Three displays the share graph. You will be requested to enter a "Pause" factor. The value (50 = 1 second) determines the speed at which the share price data will be plotted. Upon entering the value, a base line will be drawn, which is mid-point to the screen, from which all subsequent plotting will be performed. Before plotting commences, you have the option of moving the base line either up or down the screen, just in case your share rockets up or plummets down. If you move the base line, the final position will not have to be subsequently repositioned next time the graph is displayed, as the value of the position will have been recorded. Whilst you view the graph being plotted, your attention will be drawn if and when a new "High/Low" value is achieved. It will also display the current price with associated dates.

Option Six will display your portfolio. Use this option when you want a quick look at the current situation of your share/s. It will display, amongst other details, the current price together with whatever associated profit or loss.

Options Four and Five - saving and loading share prices - are fully explained on screen.

Finally Option Seven is a facility to use if you only want a quick look at your Portfolio or perhaps determine a Share Reference for subsequent loading of a share.

If you are using Share Portfolio for the

first time you must use Option 1 as this sets up the initial Share Portfolio. Answer "Y(es)" to the initial question "is it first time to set up any Share". After using Option 1, go to Option 2 and enter share price details. After entering share details go to Option 4 (Save Share Prices).

You are now set up for all subsequent updating and creating, if desired, new share details. Should the program for some unforeseen reason stop, type in "GOTO 10" and the program will be restored and will return you to Menu.

Prepared Notes

The maximum number of share prices you can retain within a Share file is 80, at

each "plot" or a price is 3 pixels. When you come to enter the 80th price, the program will warn you of this, and give the necessary instructions (Line 2010), of what course of action to take.

If you want to only view your Portfolio (Option 6) you must use Option 7 (Load Portfolio File) first.

When you "Save" your first share file, three Data files are created, each bearing the same "Share Reference", but suffixed with the letters "A", "B" & "C" ie, if File Ref was "BT1" first file would be "BT1A" etc. Each of these three files is to hold the data stored in the NSP and OS arrays.

In addition to these three files, two other files are automatically created, which are called "Portfolio" and "Portfolioe". These files contain the data, as the name suggests, for the Portfolio file and are contained within the Data Arrays P and R .



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Memory breakdown

Check your memory on the QL with this multi-tasking utility written by John Lawlor

This is a multitasking job for the QL called *Systat*. The job gives a complete memory usage breakdown with a couple of novel features - use of the function keys to activate/deactivate the output and the restoration of the original screen contents upon deactivation, which considerably enhances the QL's windowing ability.

Information output includes Resident Procedure Area, Transient Program Area, Superbasic Area, Channels/Heaps Area, Resource Management/System Variables Area, Immediate Free Space, Total Memory Usage, Largest Available Transient Program Area and Largest Available Heap Space.

The first seven of these are calculable from Basic but the last two are only accessible via system traps and hence need machine code. Use of the program provides a useful insight into how QDOS executes memory management and is extremely useful when those 'Out of Memory' messages appear when trying to load multitasking programs which require Heap space.

The loader is fairly self-explanatory and, due to the large amount of Data statements, includes comprehensive error checking after every 16 bytes. A very important point which is not documented anywhere is that the minimum data space you should allocate to a multitasking job appears to be about 288 bytes (line 1078). I first imagined that QDOS would require only enough room

to save the registers, say 128 bytes. However, if you try altering the 286 to, say, 128 bytes, then *Systat* will apparently run perfectly - now do a New and after a few operations the QL will crash, sometimes giving an unstoppable ASCII dump of the ROM from address 0! The extra Data space must be for channel ID's etc, while a New is occurring.

After a successful loading a small window is opened in the top left hand corner of the screen containing the message 'FI to Activate'. At this stage the program is running at the lowest possible priority - 1/127. Upon pressing function key 'FI' three things happen:

- 1) The priority is increased to 64/127.
- 2) The contents of the screen where the main window will be opened are copied into a Heap area for eventual restoration. This enhances the windowing features of the QL by leaving the screen intact after the job has been deactivated. If there is insufficient Heap space available than a warning message to this effect will be printed in the main screen window.
- 3) The main screen output window is opened.

Output now commences with the Resident Procedure Area, the Transient Program Area, the Basic area, the channels/heaps area (any area allocated for the screen save will be deducted as thus is released upon deactivation), the resource management/system variable area, the immediate free space (SV-BASIC-SV-FREE) and the total memory used

including the screen but ignoring the temporary screen save area. The next statement is the largest available Transient Program area (MT-FREE, TRAP#1, DO=6) - note that this space is not necessarily there at the moment. The last parameter, the largest available heap area, uses MT-ALCHP - Trap#1, DO=18 and attempts to obtain a heap area progressing from 592K (for those with the full 640K memory) in 1K steps until no error occurs. At this point *Systat* decides if the area allocated is larger than the screen save area - if a screen save occurred, and also whether they are contiguous before deciding the largest available area. The heap space is then removed.

Finally, the message 'FS to Deactivate' appears; upon deactivation *Systat* restores the screen contents (if they were saved) releasing the Heap area used, restores its own priority to 1/127 and returns to waiting for FI to be pressed.

Systat as listed works in monitor Mode 4 but will also work in Mode 8 if you use <CTRL>F5 to control screen scrolling. If you wish to patch the loader for TV mode, ie, move the output windows away from the origin 0,0 then answer 'Y' to the patch prompt and follow the instructions.

Once you start using *Systat* you will notice that QDOS lets the memory fill right up before doing any pruning. For instance, load and then remove a Transient Program and note that the space is still allocated, ie, it isn't released as microdrive buffer storage! Memory reorganisation only occurs when something drastic happens such as a New, reset or memory overflow - and even then it will still sometimes persist with Out of Memory messages when you know better!

```

1000 REMITK Systat Loader
1002 a=REMPTR(1296)
1004 RESTOR 1211
1006 offset=0
1008 FOR n=11 TO 67
1010 checksum=0
1012 FOR m=1 TO 16
1014 READ byte
1016 POKE a+off+byte,byte
1018 offset=offset+1
1020 checksum=checksum+byte
1022 END FOR m
1024 READ chk
1026 IF chk=checksum THEN PRINT "**** ERROR - Data Line 12
";:STOP
1028 END FOR n
1030 FOR n=1 TO 12
1032 READ byte
1034 POKE a+off+byte,byte
1036 offset=offset+1
1038 END FOR n
1040 FOR n=1 TO 12
1042 READ length
1044 POKE a+off+length,length
1046 offset=offset-2
1048 READ messages
1050 FOR m=1 TO length
1052 POKE a+off+CODE(messages$(m))
1054 offset=offset+1
1056 END FOR m
1058 END FOR n
1060 checksum=0
1062 FOR n=1 TO 64
1064 READ byte
1066 checksum=checksum+byte
1068 POKE a+off+byte,byte
1070 offset=offset+1
1072 END FOR n
1074 RFAD CLK
1076 IF CLK>CHKSUM THEN PRINT "**** ERROR in final data at
statements".STOP
1077 patch
1078 SLEEK MDV1_Systat,8,1296,356
1080 ERNC mdv1_systat
1211 DATA 96,14,0,0,0,0,74,251,0,0,83,89,83,84,65,34,929
1212 DATA 114,255,116,1,112,11,78,65,67,250,5,32,52,120,0,2
00,1496
1213 DATA 78,146,67,250,0,54,52,120,0,208,78,146,71,230,4,2
16,1740
1214 DATA 28,188,9,1,0,0,18,60,0,66,107,0,4,23,63,579
1215 DATA 0,6,23,124,0,2,0,7,112,17,78,65,12,1,0,2,449
1216 DATA 102,218,114,255,116,64,112,11,78,65,116,295,34,50
0,0,1600
1217 DATA 95,48,112,24,78,65,67,250,4,104,74,128,103,6,18,1
88,1304
1218 DATA 0,0,96,42,18,188,0,1,73,250,9,90,40,136,36,134,0
37
1219 DATA 0,2,0,0,52,60,0,139,54,80,0,13,32,210,68,198,850
1220 DATA 81,203,255,250,213,252,0,0,64,81,202,255,236,67
,250,2409
1221 DATA 2,236,52,120,0,200,78,146,47,8,67,250,4,96,12,17,
1279
1222 DATA 0,1,109,14,51,120,0,208,67,250,2,220,78,146,97,0,
1364
1223 DATA 2,18,67,250,2,234,52,120,0,208,78,146,157,206,34,
57,1633
1224 DATA 0,2,128,32,146,185,0,2,128,28,46,60,97,0,2,20,879
1225 DATA 92,87,97,0,1,240,67,250,2,226,52,120,0,208,78,146
,1606
1226 DATA 24,57,0,2,128,28,146,185,0,2,128,20,221,193,97,0,
1241
1227 DATA 1,242,97,0,1,208,67,250,2,222,52,120,0,208,78,146
,1694
1228 DATA 34,57,0,2,128,20,146,185,0,2,128,10,221,193,97,0,
1229

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1229 DATA 1.210.97.0.1,176.57.250.2.218.52.120.0.208.78.146
1230 DATA 34.57.0.2.128.12.146.185.0.2.128.4.67.250.3.146.1
164
1231 DATA 74.17.103.6.146.188.0.0.32.48.221.193.97.0.1.164.
1290
1232 DATA 97.0.1.130.67.250.2.200.52.120.0.208.78.146.34.57
1442
1233 DATA 0.0.128.4.146.188.0.2.128.0.221.193.97.0.1.132.12
42
1234 DATA 97.0.1.58.67.250.2.228.52.120.0.208.78.146.34.57.14
1395
1235 DATA 0.129.0.0.128.0.97.0.1.108.97.0.1.72.97.0.734
1236 DATA 1.88.67.250.2.128.52.120.0.208.78.146.34.57.0.2.1
271
1237 DATA 128.16.146.185.0.2.128.12.67.240.3.38.78.17.103.6.
1175
1238 DATA 310.188.0.0.33.48.97.0.1.58.97.0.1.54.67.250.1073
1239 DATA 2.182.52.120.0.208.78.146.47.78.112.6.78.65.32.95.1
231
1240 DATA 97.0.1.32.97.0.0.234.67.250.2.188.52.120.0.208.13
68
1241 DATA 78.146.47.8.34.60.0.9.64.0.116.253.112.24.78.65.1
996
1242 DATA 74.128.103.36.12.129.0.0.4.0.103.54.129.0.0.730
1243 DATA 4.0.96.290.67.250.2.252.74.17.109.8.94.60.0.0.1147
1244 DATA 34.48.96.64.66.60.129.95.60.67.250.2.183.74.17.103.4
4.133
1245 DATA 73.255.1.118.42.84.219.292.0.0.35.84.177.205.102.
8.1630
1246 DATA 0.129.0.0.25.64.96.29.12.129.0.0.35.48.98.12.684
1247 DATA 112.25.78.65.34.60.0.0.25.48.96.8.47.1.112.25.746
1248 DATA 78.65.34.31.32.93.97.0.0.154.97.4.0.120.97.0.900
1249 DATA 0.136.67.250.2.83.52.120.0.208.78.146.114.255.116
1.1627
1250 DATA 112.31.78.65.71.250.2.144.38.188.9.1.0.0.18.60.10
4.7
1251 DATA 0.0.66.107.0.4.23.65.0.6.23.124.0.2.0.7.427
1252 DATA 112.17.78.65.12.1.0.32.102.218.67.250.2.52.74.17.
1699
1253 DATA 103.0.253.138.73.250.0.242.32.84.96.124.0.2.0.9.1
337
1254 DATA 52.60.0.139.94.60.0.13.36.152.88.138.81.203.255.3
50.1583
1255 DATA 210.252.0.0.0.64.81.203.255.216.32.84.112.25.78.6
3.1699
1256 DATA 96.0.253.90.67.250.2.36.52.120.0.208.78.146.52.12
0.1970
1257 DATA 0.208.67.150.1.228.78.146.114.10.118.245.112.5.78
.67.1737
1258 DATA 78.117.66.128.66.170.68.131.67.250.1.216.211.252.

```

Summer School Courses in COMPUTING

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10am-1pm, Tuesday and Wednesday, 1-28 August
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Graphic notes

Experiment with sound for your games using this utility by Andrew Esmond

The Commodore 64 has, in its SID chip, one of the best sound chips available on a home computer. However, due to the wisdom of Commodore, the SID can only be accessed by the Poke command, needing at least six commands to bleep, let alone perform some of its more complicated functions. Using these Pokes once an effect has been worked out is tolerable; however, for experimenting, this system is almost impossible.

The program listed here takes some of the effort out of experimenting by allowing the various envelope values to be graphically displayed and altered using a couple of keystrokes.

When the program is initially Run, a bar chart is displayed which illustrates the attack, decay, sustain and release values for all three voices: attack in green, decay in red, sustain in yellow and release in blue. Below this the type of waveform, note frequency and pulse frequency (for the pulse waveform) are displayed. The volume is shown at the top of the screen below the status line which shows which voice is being played or used.

The Play section is very simple. On pressing P for play, you are asked which voice you wish to play; press 1,2,3 or A

(all). The voice is then played. The Alter section is slightly more complicated. The initials presented stand for: A-attack; D-decay; S-sustain; R-release; F-frequency; P-pulse frequency; W-waveform; V-volume; X-exit to main program. The A,D,S and R alterations are carried out by pressing + or - to increment or decrement the respective value(s). X exits to the alteration choice menu.

The frequency and pulse frequencies are input using the Basic input statement. Take care not to hit Return without entering a number as this will upset the display. The range of values for frequency are 0-65535 and 0-4096 for pulse frequency (Hz). The volume is altered in the same way, values for 0-15 are allowed. The wave form is altered by pressing the initial letter of the waveform you want, the abbreviations are Triangular waveform, Sawtooth waveform, Pulse-pulse waveform. The frequency for the pulses can be altered to any value between 0-4096. Noise is the white noise waveform.

Program Notes

100-230 Initialises the main variables and sets the screen colours.
900-960 Sets up a trial set of

values to test the display routine, delete this when you are sure it is working.

Display the values and draw the graph. Choice selection and execution.

This is the routine to play an effect.

The various alteration routines are called from here.

This is the routine to alter the attack. Part of this routine (3280-3290) is used to alter the on-screen graph and is called by the other routines.

This alters the decay. This alters the sustain. This alters the release. This section inputs and checks a new value for the frequency.

This section inputs and checks a new value for the pulse frequency.

This routine is used for changing the waveform. Inputs and checks the new volume level.

A message used for the adar alter routine.

This just clears the bottom two screen lines.

This clears the sound registers.

```

100 REM*****C64 SOUND EDITER *****VER1.00*****
110 REM*****BY ANDREW ESMOND*****VER1.00*****
120 FOR I=32900-6 TO 32901-6:POKE I,0:PRINT":"
125 PV=1:PF=0:D=0:S=0:R=0:F=0:W=0:V=0:NEXT
145 DIM A(3),D(3),S(3),R(3),F(3),W(3),PV(3),N(3):A(1)=1:PV(1)=15:V(1)=15
150 VTR1$="* VOICE 1* VOICE 2* VOICE 3* ALL VOICES"
155 VTR2$="* VOICE 1* VOICE 2* VOICE 3* ALL VOICES"
170 VTR3$="* VOICE 1* VOICE 2* VOICE 3* ALL VOICES"
180 VTR4$="* VOICE 1* VOICE 2* VOICE 3* ALL VOICES"
190 WNC$="*TRIANG*SAWTO*PULSE*NOISE*":WNS(4)="*NOISE*":VL=15
200 CL=1678:CL2=1680:CL3=1681:CL4=1682:CL5=1683:CL6=1684:CL7=1685:CL8=1686:CL9=1687:CL10=1688:CL11=1689:CL12=1690:CL13=1691:CL14=1692:CL15=1693:CL16=1694:CL17=1695:CL18=1696:CL19=1697:CL20=1698:CL21=1699:CL22=1690:CL23=1691:CL24=1692:CL25=1693:CL26=1694:CL27=1695:CL28=1696:CL29=1697:CL30=1698:CL31=1699:CL32=1690:CL33=1691:CL34=1692:CL35=1693:CL36=1694:CL37=1695:CL38=1696:CL39=1697:CL40=1698:CL41=1699:CL42=1690:CL43=1691:CL44=1692:CL45=1693:CL46=1694:CL47=1695:CL48=1696:CL49=1697:CL50=1698:CL51=1699:CL52=1690:CL53=1691:CL54=1692:CL55=1693:CL56=1694:CL57=1695:CL58=1696:CL59=1697:CL60=1698:CL61=1699:CL62=1690:CL63=1691:CL64=1692:CL65=1693:CL66=1694:CL67=1695:CL68=1696:CL69=1697:CL70=1698:CL71=1699:CL72=1690:CL73=1691:CL74=1692:CL75=1693:CL76=1694:CL77=1695:CL78=1696:CL79=1697:CL80=1698:CL81=1699:CL82=1690:CL83=1691:CL84=1692:CL85=1693:CL86=1694:CL87=1695:CL88=1696:CL89=1697:CL90=1698:CL91=1699:CL92=1690:CL93=1691:CL94=1692:CL95=1693:CL96=1694:CL97=1695:CL98=1696:CL99=1697:CL100=1698:CL101=1699:CL102=1690:CL103=1691:CL104=1692:CL105=1693:CL106=1694:CL107=1695:CL108=1696:CL109=1697:CL110=1698:CL111=1699:CL112=1690:CL113=1691:CL114=1692:CL115=1693:CL116=1694:CL117=1695:CL118=1696:CL119=1697:CL120=1698:CL121=1699:CL122=1690:CL123=1691:CL124=1692:CL125=1693:CL126=1694:CL127=1695:CL128=1696:CL129=1697:CL130=1698:CL131=1699:CL132=1690:CL133=1691:CL134=1692:CL135=1693:CL136=1694:CL137=1695:CL138=1696:CL139=1697:CL140=1698:CL141=1699:CL142=1690:CL143=1691:CL144=1692:CL145=1693:CL146=1694:CL147=1695:CL148=1696:CL149=1697:CL150=1698:CL151=1699:CL152=1690:CL153=1691:CL154=1692:CL155=1693:CL156=1694:CL157=1695:CL158=1696:CL159=1697:CL160=1698:CL161=1699:CL162=1690:CL163=1691:CL164=1692:CL165=1693:CL166=1694:CL167=1695:CL168=1696:CL169=1697:CL170=1698:CL171=1699:CL172=1690:CL173=1691:CL174=1692:CL175=1693:CL176=1694:CL177=1695:CL178=1696:CL179=1697:CL180=1698:CL181=1699:CL182=1690:CL183=1691:CL184=1692:CL185=1693:CL186=1694:CL187=1695:CL188=1696:CL189=1697:CL190=1698:CL191=1699:CL192=1690:CL193=1691:CL194=1692:CL195=1693:CL196=1694:CL197=1695:CL198=1696:CL199=1697:CL200=1698:CL201=1699:CL202=1690:CL203=1691:CL204=1692:CL205=1693:CL206=1694:CL207=1695:CL208=1696:CL209=1697:CL210=1698:CL211=1699:CL212=1690:CL213=1691:CL214=1692:CL215=1693:CL216=1694:CL217=1695:CL218=1696:CL219=1697:CL220=1698:CL221=1699:CL222=1690:CL223=1691:CL224=1692:CL225=1693:CL226=1694:CL227=1695:CL228=1696:CL229=1697:CL230=1698:CL231=1699:CL232=1690:CL233=1691:CL234=1692:CL235=1693:CL236=1694:CL237=1695:CL238=1696:CL239=1697:CL240=1698:CL241=1699:CL242=1690:CL243=1691:CL244=1692:CL245=1693:CL246=1694:CL247=1695:CL248=1696:CL249=1697:CL250=1698:CL251=1699:CL252=1690:CL253=1691:CL254=1692:CL255=1693:CL256=1694:CL257=1695:CL258=1696:CL259=1697:CL260=1698:CL261=1699:CL262=1690:CL263=1691:CL264=1692:CL265=1693:CL266=1694:CL267=1695:CL268=1696:CL269=1697:CL270=1698:CL271=1699:CL272=1690:CL273=1691:CL274=1692:CL275=1693:CL276=1694:CL277=1695:CL278=1696:CL279=1697:CL280=1698:CL281=1699:CL282=1690:CL283=1691:CL284=1692:CL285=1693:CL286=1694:CL287=1695:CL288=1696:CL289=1697:CL290=1698:CL291=1699:CL292=1690:CL293=1691:CL294=1692:CL295=1693:CL296=1694:CL297=1695:CL298=1696:CL299=1697:CL300=1698:CL301=1699:CL302=1690:CL303=1691:CL304=1692:CL305=1693:CL306=1694:CL307=1695:CL308=1696:CL309=1697:CL310=1698:CL311=1699:CL312=1690:CL313=1691:CL314=1692:CL315=1693:CL316=1694:CL317=1695:CL318=1696:CL319=1697:CL320=1698:CL321=1699:CL322=1690:CL323=1691:CL324=1692:CL325=1693:CL326=1694:CL327=1695:CL328=1696:CL329=1697:CL330=1698:CL331=1699:CL332=1690:CL333=1691:CL334=1692:CL335=1693:CL336=1694:CL337=1695:CL338=1696:CL339=1697:CL340=1698:CL341=1699:CL342=1690:CL343=1691:CL344=1692:CL345=1693:CL346=1694:CL347=1695:CL348=1696:CL349=1697:CL350=1698:CL351=1699:CL352=1690:CL353=1691:CL354=1692:CL355=1693:CL356=1694:CL357=1695:CL358=1696:CL359=1697:CL360=1698:CL361=1699:CL362=1690:CL363=1691:CL364=1692:CL365=1693:CL366=1694:CL367=1695:CL368=1696:CL369=1697:CL370=1698:CL371=1699:CL372=1690:CL373=1691:CL374=1692:CL375=1693:CL376=1694:CL377=1695:CL378=1696:CL379=1697:CL380=1698:CL381=1699:CL382=1690:CL383=1691:CL384=1692:CL385=1693:CL386=1694:CL387=1695:CL388=1696:CL389=1697:CL390=1698:CL391=1699:CL392=1690:CL393=1691:CL394=1692:CL395=1693:CL396=1694:CL397=1695:CL398=1696:CL399=1697:CL400=1698:CL401=1699:CL402=1690:CL403=1691:CL404=1692:CL405=1693:CL406=1694:CL407=1695:CL408=1696:CL409=1697:CL410=1698:CL411=1699:CL412=1690:CL413=1691:CL414=1692:CL415=1693:CL416=1694:CL417=1695:CL418=1696:CL419=1697:CL420=1698:CL421=1699:CL422=1690:CL423=1691:CL424=1692:CL425=1693:CL426=1694:CL427=1695:CL428=1696:CL429=1697:CL430=1698:CL431=1699:CL432=1690:CL433=1691:CL434=1692:CL435=1693:CL436=1694:CL437=1695:CL438=1696:CL439=1697:CL440=1698:CL441=1699:CL442=1690:CL443=1691:CL444=1692:CL445=1693:CL446=1694:CL447=1695:CL448=1696:CL449=1697:CL450=1698:CL451=1699:CL452=1690:CL453=1691:CL454=1692:CL455=1693:CL456=1694:CL457=1695:CL458=1696:CL459=1697:CL460=1698:CL461=1699:CL462=1690:CL463=1691:CL464=1692:CL465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Private function

Program your own function keys on the Amstrad with this routine from John Hurst

One of the many clever features of the Amstrad is its ability to support Function Keys. The keys in question are those on the numeric pad, to the right of the main keyboard. By using the "Key Def" command (as described in Chapter 8, p23 of the Manual), one can re-assign these keys, so as to make them carry out quite complicated manoeuvres. This can be particularly useful when writing a Basic program: there are a lot of commands, which get used over and over again, and it is a tremendous convenience to be able to carry them out with a single key-stroke, rather than to type them in individually in full.

Of course, everyone has his, or her own list of pet functions, but the list given here is the result of some considerable time spent programming on the 484. I keep the program which loads them on a cassette of its own, and Load this before every session, so that the keypad is always primed with the special functions.

The list of functions is given in Fig 1, which shows their distribution on the key-pad. Fig 2 is the Basic program listing to implement them. Here's a breakdown of what they are each designed to do:

"ENTER" is left alone and not re-programmed. It does "ENTER" when used normally and a "LOAD & RUN", when used with CTRL.

".," give Cls:List. You are always needing to List a program under construction, when it has been changed, or had a line added. This particular setting does not allow a line to be specified, as the "Chr\$(13)" in the function ensures that the new function executes itself.

"0" gives Run. Another obvious must. These last two commands, I find, are the most commonly used, which is why they are assigned to the two keys next to enter.

"7" gives Chr\$(- but obviously doesn't execute. The idea is to use it in combination with Key 8 (giving '"/'), so that one can insert Chr\$(xx), with the minimum fuss.

"9" gives &. This is used when compiling Data lists - if, like me, you tend to use Hex notation when preparing User Defined characters, with the help of Symbol (Ch.8 p46 of the Manual). This key setting makes it very easy to write: &00,&FF,&FO,&F etc, etc.

"4" gives ".,. Also used for Data lists, this time for strings - as in, "Peter", "Ann", "David". The Function has to be written using Chr\$(34), as the double quote otherwise gets the Basic in a muddle.

"5" gives -. and for the reason in the paragraph above, this is chosen to give a printed double quote.

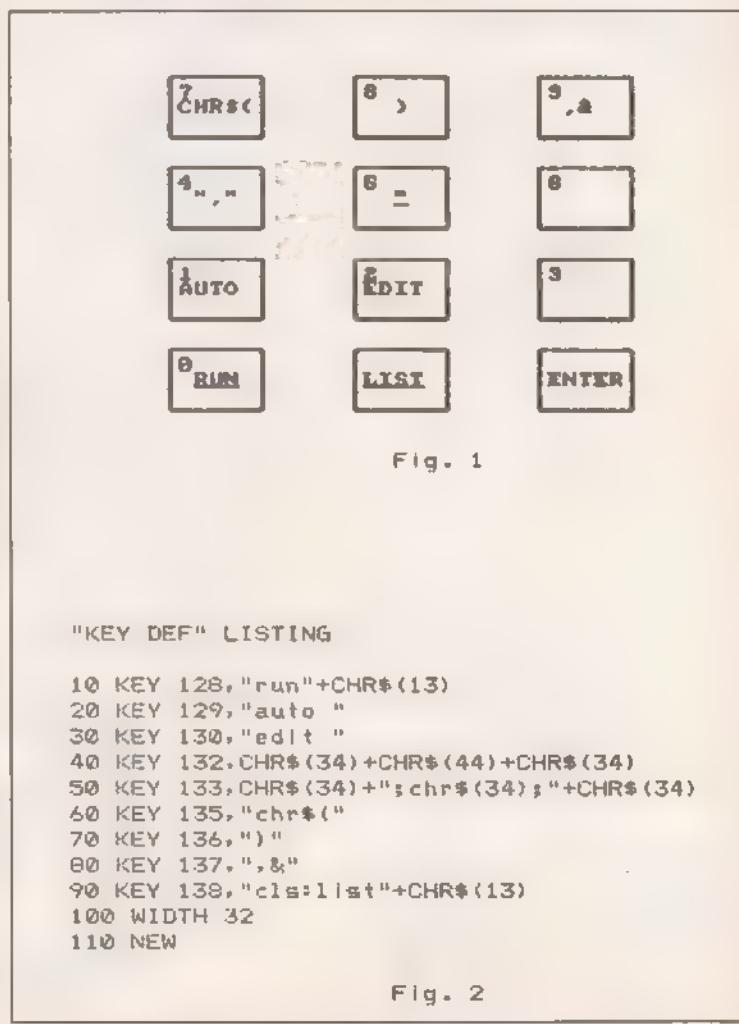
"1" gives Auto. It is not allowed to execute, as you usually want to specify the line number - almost invariably the next line number of the program. Somewhere in the Basic must be hidden the value of the existing last line of the program, so that one ought to be able to get the Function to discover its own "next Line" number.

"2" gives Edit. Again, this is an obvious function to have on the pad, when writing a program. Like Auto: the function incorporates a space at the end, so that it is possible to type in directly the

Line number you want to edit.

Two further lines are added to the Key Def program. At Line 100 Width 32 which is only useful if you have a printer, as it sets the line length used. I have a roll of 3½ inch cash register paper permanently fed into my Brother M-1009 for scratch print-outs, and this setting just fits the roll. The paper is held in an adapted toilet roll holder, but this is not meant to be a reflection on the value of the software.

Finally, the last line of the program is New. This effectively clears the decks for another Basic program, but leaves all the newly defined Functions in place. Obviously, the selection given here doesn't end the possibilities for the Function keys. Two keys have not yet been assigned; you may want to add some more commands, or change the ones I have suggested. But having your own cassette for Loading before you do any programming, is a very worthwhile investment.



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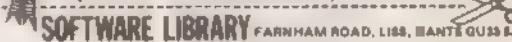
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Tony Bridge's Adventure Corner



Faithful following

A Arrow of Death, from Adventure International seems to have had a very faithful following over the last few months, and I'm not surprised, as it has quite a lot of atmosphere, despite the usual syntax problems that Brian Howarth programs display - the players spends much of the time searching for the right combination of words, and to me that's daft. The *Daily Telegraph* or *Times* both have better crosswords if that's what you're after!

However, *Arrow*, as I've said, does keep the interest alive, and most of the problems holding people up are to do with getting into the Giant's Building, without being killed (well, you didn't think that this was going to be easy, did you?). Of course, before going into the Castle, wouldn't it be best to nobble the Giants? To do this, take the Toadstools from the Clearing and add them to the Broth in the Cookhouse Cauldron - just type "Poison (or Drug) Broth". This will put the Giants to sleep and allow you to proceed unhindered. The problem of the Guardians by the Sacred Willow is solved by throwing the Medallion - you should then cut the branch.

In pursuit of Trivia No. 1: Go West is, as you'll know, a phrase which adventurers will have used many times - it's also, of course, now better known to the world at large as the name of one of the latest successful groups. One of the two guys who make up the band, Richard Cox and Peter Drummond (I'm not sure which), is a keen Beeb user and adventurer - when a name for the group had to be found, what else could it be? Go West, young man!

Now back to the most enduring adven-

ture of them all, *Colossal Adventure* to give it just one of the names by which it is known. It is, whatever the name, the original and classic game as implemented on the huge mainframes of several years ago. It is classic, not only because it was the first and probably best-known, but also because the problems contained therein display a neat simplicity that has remained unsurpassed.

There are several versions for home micros, probably the best, for us British adventurers, that from Level 9, boasting as it does a lengthy end-game not featured in the original. The problems in the first part are, in most respects, the same as the original, and most of the versions available are much the same as each other, differing only in the wording needed to solve the problems. A major difference, however, is found in the Abersoft version, now marketed by Melbourne House as *Classic Adventure*. The first problem in the adventure is how to get past the snake - the solution has been revealed about 54 times in various places, so I will not be giving anything away by saying that you must first get the Bird (how? Well, that is another sticky problem, but let's say that birds in this cave system are rather tame except when they see Black Rods!), and then release it in the presence of the old snake, which takes fright and slithers off. Abersoft, rather humorously, think that the snake will eat the bird.

As evidence that the problems are as tough as ever, I still get many letters regarding *Classic Adventure*, whatever the version is called. "I can get across the fissure, but the only place I can get to from there is where Batteries are for sale. Please help!" So says G S Kewin of The Isle of Man. The vending machine is in the Different Maze, and, as you have found, contains batteries for your lamp, and you'll need a coin to feed into the machine. To get out of the Maze from the Vending machine, go North and Up. You should be back in the West end of the Long Passage. Now go East, then North, North and Up - this will bring you to the Slab Room, and from there quite a few locations will become open to you. Of course, you can go to other places from the Maze - nearby is another Maze, this one being of rooms all the same, which contains the Pirate's Chest. Bill from Knottingley was encouraged to try Co-

lossal Adventure and has done quite well - up to a point. "What do I do with the Gazette, where is the Pirate's Maze, how do I get my treasure back when he pinches it?" You should know the answers to most of your questions now, Bill - the Gazette, which is found not far from the Slab Room mentioned before, can of course be read, but can also be left ■ the next location (Witt's End) for extra points. But beware, it's not easy to leave once in there, though repeatedly typing South should do the trick.

In his recent letter, Dave Chapman of Timperley also mentions *Colossal Adventure*: "On writing to Level 9 for a free clue, which together with help from The Corner enabled me to complete the game, I commented that I thought having four mazes in one game was a bit much, and also wondered why one should have to go back to the start of the first part when failing the second - Level 9 wrote back to say 'are you playing *Colossal*? Overall, though, I thought that *Colossal* was good, and I look forward ■ trying Level 9's next tape."

I agree that four mazes is pouring on the agony a little, and I'm not a fan of mazes anyway - but there are many adventurers who revel in the challenge. As for going back to the very start - well, it shows you the importance of saving your position before any drastic decision. Dave goes on to say: "I must mention *Knight's Quest*, one of your favourites. I have arrived at the point where the Eagle attacks you after rescuing the Princess, but have been unable to get any further - the game now gathers dust, but I would still rate this as one of the best adventures for the Spectrum. Can you help me with CCS's *The Prince*? The game loads properly, but the problem is that only Ferrando of the main characters will carry out his specific duties."

I have never had the pleasure of seeing this game, though it appeared as a listing in an issue of *Sinclair User* some months ago. Try writing to them for a back issue, and you might then be able to alter the code. But of course, you should not be expected to do CCS's work for them. Dave also says that he has completed *Planet of Death* and *Urban Upstart*, both of which he liked. The eagle problem in *Knight's Quest* is rather complex - but the outcome of the attack depends on which weapon you use to defend yourself. If you use the Sword, you will be taken to the eagle's eyrie, which is actually no bad thing. If you have found the Diamond spear in the Castle of Clouds, then you have a dead eagle.

In pursuit of Trivia, No. 2: passing an off-licence the other day (a momentous event in itself), the Grand Elf was amazed ■ see a bottle of wine displayed, with the label bearing the proud legend "Thorin!" For a mere £2.50 or so, that's good value for a wine that will sing to you about Gold.

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On the market

David Fox of Sheffield, writes:

Q How do I go about selling my own programs? I have a computer and I have made some of my own games which I feel wouldn't do too bad if marketed under my name. What do I do?

A Firstly, you will have to sell by mail order. You are unlikely to attract any of the large retailers, at least until you have established some sort of reputation. Secondly, you will have to obtain some means of duplicating your software (some form of tape copier would be best). It is probably not worth your while getting tape insets or labels produced, owing to the small quantities that you are likely to need (at least initially).

Lastly, you will need to advertise in magazines, so that the world can be told of your products. Your prices should be realistic... don't price your games as high as the retailed products - people won't buy.

Freezed computer

Angus Ross, of Norwich, writes:

Q One of the more irritating habits of my QL, which I use principally for word processing with Quill, is its habit of freezing occasionally for no apparent reason. One of the sources of unreliability with Quill is certainly the microdrive, but they do not seem to be the culprit here. Could the problem be spikes in the mains supply? *QL User*

magazine recently carried a story about a device from Power International that claimed to eliminate the problem. Is there any reason to believe the QL to be more sensitive to spikes in the mains than any other home computers? I have never had this problem with my Vic 20.

A A 'freezing' computer ... this symptom is usually caused by one of three things: (a) a bug in the software, (b) a faulty machine, (c) a sudden peak or low in the power supply.

I find the last one harder to believe in your case than the first two.

As you say you always use Quill, do you never have this problem when using other software on the QL? The power supply would seem to be OK, because, as you say, you have never experienced problems with your other computer.

One thing you do not mention is how long after switching on it is before you get your problem. A common problem with home computers is their uncanny knack of suddenly going 'dead' after about an hour of trouble free use.

My advice would be to try other software on the QL and see if the problem still occurs. If it does not then I suggest that you contact the shop/dealer who sold you the machine and arrange for it to be repaired.

Spectrum recorder

J Maffey of Kings Lynn, writes:

Q I am going to buy a Spectrum + and want to know if there is any cassette recorder recommended to be used with it. If so are there any special leads required?

A Any cassette recorder with 2.5mm earphones and microphone sockets should work with the Spectrum +. Ordinary mono recorders tend to give better results than stereo ones. A tape counter is an extremely useful feature to have, so that you can locate programs on a long tape.

There are a number of so called 'computer compatible' recorders on the market which do indeed give good results. The best advice is to shop around and get the best deal you can.

You will not need to get any special leads as the Spectrum comes complete with the necessary connections, etc.

Slow disc drive

K Ebberley of Manchester, writes:

Q I have a Commodore 64 and am extremely happy with it except for one thing, the disc drive is extremely slow. ■ there no way of speeding the thing up?

A Ah... you've noticed then that the manufacturer who brought you the elephant that never forgets, also brought you the disc drive that reads just about as fast as one!

In defence of Commodore, however, it is fair to say that their disc drives are comparatively cheap, and as it always the case, you pay your money and you take your choice.

There is unfortunately nothing that can really be done to speed them up; they are just built that way.

Forth alternative?

D Ruse of Bournemouth, writes:

Q I have a Sinclair Spectrum, and am very interested in programming. I have learned and mastered Basic, and want to move on to something more demanding. A friend suggested Forth as an alternative to machine code. Do you think that this is a good idea and can you recommend a good package?

A As far as recommending a good package is concerned, I need go no further than Abersoft Forth, which is widely accepted as about the best, cheap (£15.00) version available. As to whether I think that using Forth is a good idea, it depends.

If your purpose is to experiment with programming techniques, and to build up your own programs for purely personal use, then Forth is a good idea. If however you want to write programs for sale, then I would suggest machine code. I say that not because Forth is an inferior language, but because it usually requires the interpreter software to be in memory when it loads. This would, of course, bring copyright problems.

Unlimited lives

Nicola Laureran of Newton-le-Willows, Merseyside, writes:

Q For Christmas I received a CBM 64, I also received a tape called *Minic Miner*. So far I haven't got farther than Room 1. While reading a back issue of *Popular*, I saw a set of *Pokes* compatible with the Spectrum version. Is there a set of codes on the CBM that will enable me to get into any room I like? I'm desperate!

A In Vol 4 No 1 Tony Kendle (Arcade Avenue) printed just the things you need to know. As I know the feeling well of trying to get past that stupid creature and those silly flowers... here are the *Pokes*: Type, Verify (return), Load ",,1,(return and play), Poke 16573,234 (return), Poke 16572,234 (return), Poke 16571,234 (return), Sys 16384 (return).

These *Pokes* give you unlimited lives, which should give you enough time to work out how to finish each room.

Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem *Peek* it to Phil Rogers and every week he will *Poke* back as many answers as he can. The address is *Peek & Poke, PCW, 12-13 Little Newport Street, London WC2R 3LD*

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ORIC Atmos 48K less than one month old but I'm now emigrating to USA and it won't work over there hence bargain price £59 Phone Greg, Brighton (0273) 600070

AMSTRAD CPC 464 colour complete with joystick software and books. Excellent condition, £280 Tel: Ashford (Middle) 53468

PRISM VTX 5000 Modem (for Spectrum) complete with connector, etc. Hardly used £40 Tel: 01-800 4044

ZX Printer - 4 rows, £15.00; DK-Tronics Character Board (ZX81) £12.50, Zon-X Programmable Sound Generator (Amp/Spirk) BI-Spec, £12.50. Glanmore Realtime Clock-Cal I/O Board ZX81 £16. Macrotronic 8802 SPU TV/Cass leads, £40 McKenzie Preston 864999

ORIC Atmos 48K under makers guarantee with technical software including unique five equation curve fitting, tension vibrations, spreadsheet, analysis, etc. Also books £65 one. Tel: 0785 52189 evenings

AMSTRAD, colour monitor, 2 joysticks, several books, mags £400 or original s/w. Swap for BBC or C64 with disc drive. Tel: 0800 08814, Knott (daytime).

MODEMS: prism 75/1200 Acoustic, £15.50. Stephen 30/300 direct connect Bim-1 phone £30 BBC joysticks £5. Tel: 01-684 6228, Peter Knight

CBM 64 801 Printer with paper, £125. Tel: 01-837 0987

NEWBRAIN Ad 40/80 columns with latext Rom. This excellent micro for sale at only £126. O/S software manual £15. Tel: Farnborough (0252) 540633.

SONY MBX computer with 4 game cartridges won in local radio competition, £260ono Tel: Wrexham 762338

PARTH self centering BBC joysticks and seven Discs, three of which have games on them. Metros Planoids etc. Arcadians Self separately or the lot for £25 Tel: 01-327 2155

EPSON MX82 printer with stock Cartridges and software for COMM 84 £125 one. Tel: 051 933 3986 anytime ask for Dave. Can deliver (free box of paper).

KEMPSTON joystick and interface for sale, only £17.50 Cambridge joystick tape and interface only £22.75 Tel: 01 348 3924 and ask for Graham.

BROTHER EP-22 printer/typewriter RS 232 cable or minicom (adaptor inc), thermal or ordinary paper £80 Tel: Blackpool (0263) 38389, carriage extra.

STONECHIP programmable joystick interface + will sell for £15 or will swap for ZX printer + paper Tel: 0281 32561 (after 3.30pm on weekdays)

BROTHER 10Rb printer (RS232), months old power supply and manual £100 Tel: 01-221 7072

FOR SALE Retronics Wafdrive with 3 Wafdis + Word Processor £80 or swap for A4 width printer must be in good condition Tel: Wigton 36284 or write Tommy 127 Spring Street, Wigton.

AMSTRAD CPC484 3 months old, little used, includes colour monitor. Quick sale £300 o.n.o. Tel: 902 2788, after 8pm. Mem to Fr. Ask for Amstril

ZX81s for Sale

ZX81 s/w £1.50 a/cdng n/a Various titles inc Assembler/Glossassembler, plus games Ring Mark 0824 52920 after 7pm

16K Ram pack for ZX81, Made by Memotech boxed v.g.c £20 o.n.o. Tel: 01-937 5764 after 4pm.

ZX81 16K, very good condition inc all leads and power supply. 2 manuals, loads of mags, many games inc Rocker Man Tel: Ripley 810039

ZX81 software for sale. Eight original cassettes Pimlona, Catacombs, Damns & Beast, Defender, Krakit, Asteroids, Dragon-Maze, Nightmare Park. Accept £22.50 o.n.o. the lot or will split. (0244) 675717

FULL size printer for ZX81, ASR33 teletype. Very cheap to run. No special

paper or ribbon. With interface and software Ready to run. Buyer collects £45 Phone Chippenham 653662.

ZX PRINTER vgc, £20 ZX81 s/w for sale originals only Tel: 03526 3033, after 4pm

COMPUTER package ZX81 16K, 7 games, approx 90 computer mags, all leads manual carrying case, just £48 Good beginner, with boxes Tel: Ashford Middlesex 41669.

ZX81 £12. Arron Tel: Quorn 412554 anytime after 7pm

Spectrums for Sale

SPECTRUM 48K with Kempston joystick and over £180 of S/W and books. All in perfect condition, £150 Tel: Guildford (0483) 651285 evenings.

FOR SALE: Spectrum software including Daley Thompson's Decathlon, USA Baseball 1984, Pool, Urban Upstart, Ghostbusters and Black Crystal. Thirty games in all worth £100 but I want £75, will split. Tel: Sheerness 664009

SPECTRUM SOFTWARE: Hobby Hung, White Lightning, E750 sea, Doomdark's Revenge £5.50 Dark Star £4.50 Jet Pac, Galactians, Space Shuttle Defence £3.50 ea; Night Gunner £4 Mr Davis 177 Downs Rd, Belmont Sutton Surrey SM2 5QD

KEMPSTON INTERFACE £6. Spectrum in Centronics all instructions in Rom. £35 Tel: 0733 323280 evenings

ZX SPECTRUM 48K, 275, Computer tape recorder £12 Interface 2 £9. Kempston light pen £10 Also J1 tapes £15 Hobbit and Treasure Island £10 F Shultz 78, Archer Ave, Southend-on-Sea, Essex SS2 4QT

SPECTRUM SOFTWARE: Rain, Over Moscow, Wraith, Magra, Return to Eden, L.O.M. Tower of Despair, Classic Adventure, Bunny Phasorschase, Hulk the lot, In 40, H. Martindale, 28 McMinnis Ave St. Helens Merseyside WA9 2PN

SPECTRUM LO PROFILE professional keyboard, 33 keys, £25. Also many best selling titles all at ridiculously low prices. Please send £1 for details Tel: Middlefield Lane, Huckley, Leicestershire LE12 8LJ

SPECTRUM SOFTWARE: Si pack, £15 one, boxed £100 Philips video Pac, 2 cartridges £20 one or swap for ZX printer and paper. Mark Tel: 907-5396.

SPECTRUM ORIGINALS for sale. Bear, Bear, Aquarius, Megapedia, Cassette 50 and Planoids. Only £3 each or all £10 for 12. Write to Julia Chambers 22 Bedford Avenue, Shaw CL2 7DW

SPECTRUM SOFTWARE FOR SALE: All originals, include Baseball, Bruce Lee, Burgi, Blast Destroyers, Pencil It Level 9, Out of the Shadows, etc. Tel: 01290-77641 and ask for Rob

SPECTRUM - games + joystick interface + mags + books - manual. Under guarantee Swap for CBM 64 + C64. Write with Phone number Gary Sangor 30 Station Ave, Wickford, Essex SS11 7AS

SPECTRUM 16K. Some software £55 one or exchange Brother EP22 Tel: 01-879 5047

SPECTRUM POWER PACK, £2.50 Both manuals for £4 Cassette reads £1. Horizons tape, £1, JSW, £2.50; Penetrator, £2.50 Kong, £2.50 SAE to G. Edwards, £1. The Malings, Huston Bridge Kings Langley Herts Tel: Kings Langley 06501

48K SPECTRUM, excellent condition, printer + 4 rolls of paper, cassette recorder, £700, software, soft lot for £200 Tel: Xchtrum 02020 486727

SPECTRUM SOFTWARE: Volcano, 3D Lunar Crabs, E3 each. Spawns of Fv, Voyage into the Unknown, £1.50 each. Booty £2 also Trojan Light pen, £16. Beep amplifier £10 or sell for £32 Steven Holmes Tel: Swansea 3855

BOXED SPECTRUM - with guarantee and turbo interface. Quickshot 2 and 12 games. Titles include Death Star, Inter-

ceptor, Moon Cresta, Air Wolf and many more. Total £239 but for quick sale £165 Tel: 452 5259 4pm-Bpm.

SPECTRUM 48K fitted in fuller FDS keyboard power pack, manual working order £90 posted £80 - I collected Tel: Rainham 04027 20252 (Essex)

48K SPECTRUM, joystick interface, light software mags, Quickshot II joystick Cost £279, sell £180 or swap for Atari 800XL, tape deck + games Tel: Glasgow (041) 771 4715

48K SPECTRUM with nearly £200 of original software including White Lighting, Ghostbusters, Jet-Set Willy etc plus joystick interface, all boxed, as new in excellent condition. Only £100 Tel: Horley 778276

SPECTRUM ORIGINAL SOFTWARE

SALE: Firth Assembler, Knight Lore T.L.C., Backgammon, Chess, Reversi, Castle the Cat, Omnicalc £15 Bryan Tel: 01-692 4690

48K SPECTRUM Currah Speech unit, Cassette recorder plug and leads, manuvs books and magazines, £200 or software Worth £245 sell for £200 one Tel: (059) 21450 129 for Dave

SPECTRUM SOFTWARE FOR SALE: Worth over £75, sell for £35 one all originals including Daley's Decathlon T.L.C., Micro Olymp, Omega Run Chequered Flag and eight other quicks sell Tel: 0349 882708 after 5pm

ORIGINAL SPECTRUM SOFTWARE: Cyrus Chess, Supercode III, flight simulation via Calc, Archurus, 3D Strategy etc. All boxed, mint condition £15 the lot Tel: 01-527 5483

SPECTRUM (16K/48K) tapes worth £70 Transim, Cookin Magic Mammies, CISD Pool, Bug-Byte Pool, Star Warrior, Altimar, Motor Man, Meteor Storm, Dig'ar-Dan, Roman Empire, Rifle-Range, Monsters in Hell, Spectrewalk £30 one Tel: Chraction 427538

SPECTRUM 48K, Interface joystick over 100 quality games inc Match Day, Starstrike, Decathlon etc. Many magazines and books. Still boxed Worth £155 sell for £160 one Tel: 0328 287684.

SPECTRUM SOFTWARE for sale. £30 worth of games will sell for only £15 inc p&p. Will not split. Tel: Leeds 524856

SPECTRUM 48K, Interface joystick, over 100 quality games inc Match Day, Starstrike, Decathlon etc. Many magazines and books. Still boxed Worth £155 sell for £160 one Tel: 0328 287684.

SPECTRUM (16K/48K) tapes worth £70 Transim, Cookin Magic Mammies, CISD Pool, Bug-Byte Pool, Star Warrior, Altimar, Motor Man, Meteor Storm, Dig'ar-Dan, Roman Empire, Rifle-Range, Monsters in Hell, Spectrewalk £30 one Tel: Chraction 427538

SPECTRUM 48K, Interface joystick, over 100 quality games inc Match Day, Starstrike, Decathlon etc. Many magazines and books. Still boxed Worth £155 sell for £160 one Tel: 0328 287684.

SPECTRUM SOFTWARE for sale. £30 worth of games will sell for only £15 inc p&p. Will not split. Tel: Leeds 524856

SINCLAIR QL plus manual, extra tapes. Mint condition very little usage any time £1250 for Windsor 63249.

QL with manuals + leads £250 Contact Dave Branton 88 Station Road, Reddish, Stockport, Cheshire

SPECTRUM 48K PLUS, Probot switchable interface. Quickshot 2 joysticks, lightgun, 3 program books. Over £100 of s/w. (Original) Price £150. Tel: Newquay 06373 77758

SPECTRUM software pack (all originals), Cyrus Chess, Supercode III, Palion Flight Simulation, Vu-Calc, Archurus, 3D Strategy etc. £15 and the lot. Tel: 027 527 5493

48K SPECTRUM professional keyboard, programmable interface. Kempston joystick, all in excellent condition plus over £500 of software plus tape recorder all at a bargain price of £400 Tel: Andy 01-888 9964

SPECTRUM software for sale, Games Designer £4.95, Pogo £2.95, Kong £1.95, the lot for £8. Tel: 0732 865197 after 6pm. (Originals only)

SPECTRUM for sale 48k complete with leads, instruction manual and tape recorder, only £80 Telephone 01-348 3624 and ask for Graham. First offer secures

48K SPECTRUM, tape recorder, interface 1, 2 microdrives 2 joysticks, music synthesiser, speech synthesis £300. Tel: 01-992 7210

48K SPECTRUM Interspec interface, light pen, printer + 4 rolls of paper, tape recorder, books, s/w, £200 the lot. Sell Tel: Tel Brecker 2579

ZX SPECTRUM 48K, Microspeoch, Sound Synthesiser joystick + Interface + £1250 or swap all for £200 Tel: 01-808 28641 after 4pm

ONE ORIGINAL Spectrum keyboard mini condition £10 Tel: (0493) 603965

48K SPECTRUM, under guaranteed VGC. New programmable comcon joystick interface £100 + all software. New cassette recorder. All worth £260+ but for £130 one. Phone 01-953 5505 evenings only

UNUSED SINCLAIR QL computer, quill cassette etc plus 8 microdrive cartridges. RS232 lead. Bargain £289. 511-652 1106 (5pm).

48K SPECTRUM + tape recorder, books, games and lightpen (fully boxed). Will sell for £100 one Tel: 01-883 5950

SINCLAIR QL plus manual, extra tapes. Mint condition very little usage any time £1250 for Windsor 63249.

QL with manuals + leads £250 Contact Dave Branton 88 Station Road, Reddish, Stockport, Cheshire

SPECTRUM 48K PLUS, Probot switchable interface. Quickshot 2 joysticks, lightgun, 3 program books. Over £100 of s/w. (Original) Price £150. Tel: Newquay 06373 77758

Tandy's for Sale

TANDY 100, 30K Computer + additional S/W, 1 of original price £350 excellent working condition Tel: 0532 431943

APPLE II compatible 64K 80 colour, C280 printer card £140, 2 drives £180, E180 Green Monitor 9" E30 Teac Dot matrix printer 120 CPS £220 Andrew Wong Room 5, John Adorn Hall, 15/23 Embleigh Street WC1H.

TANDY THERMAL printer model FTW-10 as new cost £80 Unwanted gift including interface cable for TRS 80 computer, paper, plug etc. Still boxed accept first £37.50 one with post Tel: 0244 875717

TANDY TRS 80 colour extended 15K joystick manual game perfect condition £70. Tel: Newcastle-upon-Tyne 324600 evenings.

Wanted

WANTED Spectrum Micro-Command (up to £30) Swap Currah Speech (VGC) for Cheetah, Sweet-Talker (sell £20) Also poly-synth (Siemens MK900 etc/casio keyboard wanted (up to £300) Tel: 0247 712862

WANTED Sinclair printer for Spectrum, must be in v. good working order, will pay £25 plus some software write to Joll, 26, Harry Price House, Hartlebury Road, Oldbury, West Midlands B65 1EQ

WANTED, Interface one and microdrive, will swap for VTX5000 Modem plus books Tel Andrew on Neath 760 992 or write to 1, Holly-graig, Crynant, Neath SA10 8TF

EXCHANGE Spectrum 16K complete on/off relay switches for Brother EP22 typewriter/printer or sell £55ono. Chris 01-979 5047 (9-5).

MEMOTECH Pascal Rom-chip wanted also Memotech RS232 communications board wanted Telephone David on (0278) 862161 after 5.30.

WANTED CBM 64 or BBC will exchange classical guitar Alhambra SC value £250 plus carrying case and footstool Phone Enfield 01-383 3363.

WANTED Atari 400 48K Ram board. Willing to swap 2 to 8 ROMs depending on condition (working board or not), or £20. Telephone Steve 061-766 2159 after 7pm.

SWAP Prism VTX5000 + software for ZX printer - paper Perfect condition. Kewen Ashbridge, 29 Queen Crescent, Frielington, Cumbria.

WANTED Oric 1 keyboard and case. Did you keep it when upgrading to Atmos? I will give you £10 for it! Write to Mr Norton, 138 Newlands Road, Shirley, Bham B30 2RH.

WANTED To buy Amstrad hardware & software (local area preferred). Mr Gerry, 3 Upper Ham Road Ham, Richmond Surrey.

WANTED Acorn Sof Velvish for BBC micro. Tel Radioddity 2632 Wanted Z80 processor.

EXCHANGE Sinclair QL for Apple II plus accessories. Write D. Jameson & Hartford Crescent, Ashton-under-Lyne, Northumbrian NE3 0CD.

WANTED cheap printer software utilities etc for Spectrum Also other cheap com puter working or not for college studies. Write Nigel Richardson, Flat 15, 22 Thicket Road, Sutton, Surrey SM1 4PS.

SWAP camera equipment for modern computer - printer Olympus OM2N outfit worth £600 Tel 0709 867968 (Essex).

WANTED Atari 800 or 400 48K Tel: South Shields 550980.

SWAP Currah Microspeech (Spectrum) for working ZX81 or broken Spectrum Please phone (0707) 42065 evenings & weekends.

SWAP Currah Microspeech + SW tape for Spectrum Printer + paper for sale £20 Tel Neil (0249) 712626.

WANTED Spectrum SW - new titles. Offers to Radiette 2673.

WANTED 48K Spectrum for spares. Pay up to £30. Can not collect. Tel 707001 Farnworth.

WANTED TI 99/4A magazines and extended basic module fair price paid 32 Glenshane Park, Dunmurry Belfast BT17 3BA Telephone 0232 623001.

WILL swap Stonechip programmable joystick interface. Quickshot II and Cambridge joystick All working perfectly for Alphacom 32 printer Phone (0555) 718111 after 5pm Mon-Fri and ask for Stuart.

WANTED Aerial 410 cassette recorder and non-working Aquarius SAB 108 Kingsway, Wellingborough, Northants NN8 2EN.

SWAP my Tokai Strat guitar and Marshall 30W Amp for your 1541 disc drive or £265 of your cash. Tel 01245 670264 after 5pm.

SWAP Amstrad CPC 484 with colour monitor, joystick cassette for Casio C2101 or synthesiser Tel to 0 Scott 26 Hardens Place, Hawick, Scotland.

WANTED ZX printer or Alphacom 32 with rolls will pay up to £15 (not inc paper). Write to Brian O'Connor 5 Arneida Tce, Kilmainham Dublin 8 Also wanted Spectrum SW.

WILL swap Stonechip programmable joystick interface. Quickshot II and Cambridge joystick. All in v.g.c for Alphacom 32 or microdrive + interface Phone (0555) 719111 after 6 o'clock Mon-Fri and ask for Stuart.

Now a poor unmap oyed Spectrum owner requires your unwanted microdrives or wadadrive. Must be very, very cheap or even free. Phone (0555) 719111 after 6 Mon-Fri Ask for Stuart.

WANTED 1 Dragon Premier, 54 Disc User for exchange of hints/tips/disk. Tel: Staines 58107 after 8pm

WANTED for Sharp MZ80K plus any other software or books including owners handbook Tel: Mr Reeves 0823 31287.

WANTED Vic 20 16K expansion and Bongi Will buy or swap for 2 bars and Wacky Wackers tape for unexpanded Vic 20 urgently Tel 0296 316 348

ZX PRINTER (working) wanted Up to £30 paid Tel 0562 740 720 after 8pm.

EXCHANGE Textile Word Processor & Colossus Chess both on disk for Basic computer on disk for Commodore 64 or light pen Tel: 01-478 7868, after 8pm

WANTED Atari 810 disk drive. Any reasonable offer considered. Write G Yennid, 1 Eastley, Basildon, Essex SS16 5TQ.

SWAP my CBM16 C3N Intro to Basic £100 games mags and books for your Atari 800 XL with tape unit, joystick and games lot Tel 0703 731472 I also have joystick

WANTED ZX80 computer. Must be in good condition with instructions etc and very cheap! ZX81 Vic 20 Jupiter Ace Aquarius etc also wanted. Must be cheap. Phone 0763 61392

SWAP Currah Speech for ZX printer or Kempson joystick Tel or write to Chris now 088 6279

OL wanted: QL monitor, Lisa Toolkit Integrated Accounts cash trader for sale OL Pascal Tel 021-749 1869

WANTED Oric and Atmos software Must be originals Also any ZX81 software and Dragon software. Cash paid for quality items. Tel 0788 819940 (after 7pm)

SWAP Spectrum 48+ upgraded + Plus Kemson Triple Joystick Interface software and £50 for CBM 64 with C2N cassette deck. Eales, 33 Lower Ellicombe Church Road Torquay, Devon

SWAP Dragon 64 2 joysticks 6 games 3 books and mags for Spectrum Plus +

Electron or se £140 one Tel: Nottingham (0602) 639882

WANTED Dragon 32/64 Edinburgh area. Will collect Any peripherals considered Tel 2506 55231

WANTED ZX81 SW Good price paid for good SW (originals only) Tel: 01-673 7591

SWAP Spectrum Plus, slr under guarantee + books + mags + joystick interface + lot of software for DBM 64 + C2N or se £160 Write Gary Sanger 30 Station Avenue Wkford Essex

COMMODORE 1541 Disc drive plus 8 discs others or exchange Spectrum 48K plus cash also Computer Modems and Membership Ask for Tony Tel 0482 820111 (anytime).

WANTED To Buy - Interface & disc drive Tel Sunderland 40851 anything

WANTED Hewlett Packard HP 86 Computer, disc drive etc, will buy for cash or part exchange for professional camera outfit Minolta R867 plus lenses Tel Wolverhampton 751679

BBC-B wanted preferably with disk drive and game willing to pay up to £400 Tel Luton 37968 after 5pm

SHERLOCK on CBM64 General tips wanted Write to Alan Cooper 22 The Crossways, Old Coulsdon, Surrey or phone Downland 55122

WANTED Dot-matrix printer RS232 any or with interface for Spectrum Must be under £100 Also wanted Teletype style printer (RS232) cheap but working Tel: Bookham 56327

WANTED 4040 Commodore dual disk drive Tel 0765 668173

AMSTRAD Penpal wanted Write to Mark Leo, 3 Leopardstown Court, Stillorgan, Co Dublin Ireland

WANTED Hi-fis sheets for Lords of Time, Adventure Quest, Dungeon Adventure Tel 0973 770507. Mr Arthur

AMSTRAD colour monitor 3 joysticks, several books, mag £400 of original SW Swap for BBC or CBM64 with disc drive Tel (0900) 65614 Keith (day)

WANTED new Spectrum SW. Very good price No copies. D. Snell Tel: Andifall 2673

WANTED Jupiter Ace, working condition Tel 01-330 3837 evenings.

COMMODORE USERS! I desperately require the following articles: "Inside CBM Dos" from Prentice Hall, Anatomy of the 1541 Disk Drive" from Adamsoft/First Publishing Phone me now!! Mine 3558 822609

ADVENTURE

HELPLINE

Colditz on Spectrum How do you stop the floor boards from cracking when getting the wire cutters? How do you get off the window ledge? Mark Howlett, 85 Byngham Harlow, Essex.

Dennis Through the Drinking Glass on Spectrum How do you get a drink and get out of number 107 R Wilson, 8 Westfield Terrace, Loftus, Saltburn, Cleveland.

Claymore Castle on Commodore

64. How do I climb the fountain without dying? How do I open the stone door? How do I get the can? Steve Hockley, 47 Fisham Green Road, Finsbury, Cov entry (0203) 418809.

Tomb of Xeops on Commodore 64 I cannot get the majestic painting, miniature pyramid or 100 grinning skulls. What was in the fruit cake? Leslie Austin, 28 Royal Avenue, West Onchan, Isle of Man.

Fantastic Diamond on Amstrad I can't open the trapdoor or musical door because the conductor says there is something missing? Mohammed Lakhi, 11 Cardinals Way, London N19.

The Tracer Sanction on Commodore 64 Where do I find Sol on Darton 16 reach Valkyron? Marco van Slageren, Longswater 299, 1669 EC Amsterdam, Holland.

Spiderman on Commodore 64 How do I reach the mysterious cloud? How do I start the process? J. Dyson, Bryn Tunon, Vaynor Park, Bangor, Gwynedd.

Sherlock on Spectrum How do you get into Bass Pippins' and Tricia Fender's London boudoir? Sarah Young, 40a Carnarvon Road, South Woodford, London E18.

Tower of Despair on Spectrum How do I get past the Demon? Roel Castelaen, Uilenholststraat 13, 2080 Merksem, Belgium.

Return to Eden on Spectrum How do I start? I keep getting zapped! Dave Edwards, 48 Rivervale Court, Higher Blackley, Manchester.

Mission 1: Project Volcano on Amstrad Please send out a pile of sand! I have got past the lift and up to the second level, but I can't get any further without being gassed. Tony Goodman, 87 Croxton Road, Ramsgate, Kent (0843 595304).

Empire of Khan on Commodore 64 How do you kill the snake and how do you get the key from the widow Nasir? Gillian Dadson, 73 Amethys Road, Christchurch, Dorset.

Jewels of Babylon on Amstrad Where is the key for the door and how does the slab move? Ma Fox, 354 Moat Road, Oldbury.

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COMPUTER SWAP

Please write your copy in capital letters on the lines below.

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COMPUTER SWAP

Computer Swap entries are limited to 30 words. Either fill in the accompanying form and send to Computer Swap, Popular Computing Weekly, 12-13 Little Newport Street, London WC2H 7PP or telephone 01-437 4343.

All software offered through computer swap must be in original condition and for private sale only.

It cannot be swapped.

Warning: It is illegal to advertise pirated software.

Amstrad

1 (1)	Knightmare	(Ultimate)	£9.95
2 (5)	Alien 8	(Ultimate)	£9.95
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Hunchback	(Ocean)	£6.90
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1 (1)	Bruce Lee	(US Gold)	£7.95
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7 (5)	Wizardore	(Imagine)	£7.95
8 (-)	Grandma	(Adventure International)	£9.95
9 (-)	Castle Quest	(Micropower)	£5.95
10 (9)	Hampstead	(Melbourne House)	£8.95

Bubbler

Magic Mushrooms	(Acornsoft)	£12.95
Combat Lynx	(Durell)	£9.95

Commodore

1 (1)	Dambusters	(Sydney/US Gold)	£9.95
2 (2)	Softaid	(Softaid)	£4.95
3 (3)	Pitstop II	(CBS/Epyx)	£9.95
4 (9)	International Basketball	(Commodore)	£5.95
5 (7)	Theatre Europe	(PSS)	£9.95
6 (-)	Shadowfire	(Beyond)	£9.95
7 (-)	Herbert's Dummy Run	(Micro-Gen)	£9.95
8 (1)	Impossible Mission	(CBS/Epyx)	£7.95
9 (10)	Spitfire 40	(Mirrorsoft)	£9.95
10 (-)	Crog's Revenge	(Sydney/US Gold)	£9.95

Bubbler

Bounty Bob Strikes Back	(Big S/US Gold)	£9.95
Strangleloop	(Virgin)	£8.95

Spectrum

1 (1)	Softaid	(Softaid)	£4.95
2 (3)	Shadowfire	(Beyond)	£9.95
3 (4)	Spyhunter	(Sega/US Gold)	£7.95
4 (8)	Tapper	(Sega/US Gold)	£7.95
5 (2)	Starion	(Melbourne House)	£7.95
6 (10)	Herbert's Dummy Run	(Mikro-Gen)	£9.95
7 (6)	Rocky Horror Show	(CRL)	£8.95
8 (-)	Falcon Patrol 2	(Virgin)	£8.95
9 (-)	Minder	(DK'Tronics)	£9.95
10 (-)	Give My Regards to Birdie	(MindGames)	£7.95

Bubbler

Chuckie Egg 2	(I.T.F.)	£6.90
Cyrion	(Firebird)	£9.95

- 1 (1) Soft Aid (Spectrum/C64)
 - 2 (3) Dambusters (C64)
 - 3 (2) Knight Lore (Spectrum/BBC/Amstrad)
 - 4 (4) Pitstop II (C64)
 - 5 (8) Alien 8 (Spectrum/Amstrad)
 - 6 (12) Herbert's Dummy Run (Spectrum/C64)
 - 7 (10) International Basketball (C64)
 - 8 (14) Theatre Europe (C64)
 - 9 (-) Revs (BBC)
 - 10 (7) Shadowfire (Spectrum/C64)
 - 11 (6) Spy Hunter (Spectrum/C64)
 - 12 (-) Tapper (Spectrum/C64)
 - 13 (5) Starion (Spectrum)
 - 14 (15) Rocky Horror Show (Spectrum/C64)
 - 15 (-) Atic Atac (Spectrum/BBC)
 - 16 (13) Impossible Mission (C64)
 - 17 (16) Ghostbusters (Spectrum/C64/Amstrad/Atari)
 - 18 (-) Spitfire 40 (C64)
 - 19 (19) Jonah Barrington's Squash (Spectrum/C64) New Generation
 - 20 (11) Minder (Spectrum/Amstrad)
- Figures compiled by Ram/C

Various Artists
Sydney/US Gold
Ultimate
Epyx/CBS
Ultimate
Mikro-Gen
Commodore
PSS
Acornsoft
Beyond
Sega/US Gold
Sega/US Gold
Melbourne House
CRL
Ultimate
Epyx/CBS
Activision
Mirrorsoft
DK'Tronics

Readers' Chart No 28

- 1 (1) Soft Aid (Spectrum, C64)
- 2 (3) Knight Lore (Spectrum, BBC, Amstrad)
- 3 (2) Everyone's a Wally (Spectrum, C64)
- 4 (4) Alien 8 (Spectrum)
- 5 (5) Confusion (Spectrum, Amstrad)
- 6 (-) Elite (BBC/Electron)
- 7 (6) Bruce Lee (Spectrum, C64)
- 8 (7) Cyron (Spectrum)
- 9 (10) Finders Keepers (Spectrum)
- 10 (8) Match Day (Spectrum)

Various Artists
Ultimate
Mikro-Gen
Ultimate
Incentive
Acornsoft
US Gold
Firebird
Mastertronic
Ocean

Winning phrase No 28: "Keen hairstyler follows yet?" from D J Bradbury of Aylward Road, Wimbledon, London SW20, who receives £25. Honourable mentions go to Neil Bond of Llanbedr-y-Moelfre, Cardiff, for "Harold Wilson's eaten a live Tory"; T Burdis of London SW14, for "Kakes for Gower? Not Cardiff" and A Hyland of Gravesend, for "Eeeekak, what is it?"

Now voting on week 30 - £25 to win

Each week Popular is compiling its own special software top ten chart - compiled by YOU.

And each week we will send £25 to the person who sends in, with their chart votes, the most original (witty, neat or clever - but never rude) phrase or sentence made up from the letters (you don't have to use them all) in the titles of the top three programs in this week's chart, published above.

You can still vote in the chart without making up a slogan - but you won't be in with a chance of winning the prize.

All you have to do is fill in the form below (or copy it out if you don't want to damage your magazine) and send it off to: Top 10, Popular Computing Weekly, 12-13 Little Newport Street, London WC2H 2PP.

Voting for Week 30 closes at 2pm on Wednesday June 19 1985. Entries received after that time will not be eligible for inclusion in that week's voting. The judges decision is final. Only one entry per individual per week will be allowed.

Name **My top 3: Voting Week 30**

Address 1

..... 2

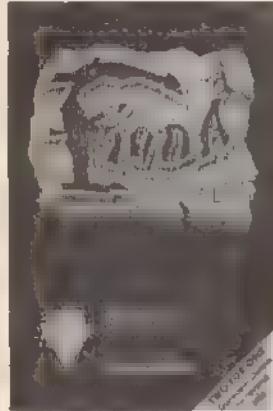
..... 3

My phrase is:

New Releases

DEMONS

Fiona Rides Out is a new release for the Commodore 64 very much in the style of *Cauldron* and *Sorcery*. For some reason arcade games which let you collect and use things using joystick controls and generally have some sort of adventure element are always connected with magic witches. Wonder why?



Anway *Fiona Rides Out* has you helping Fiona, foul witch, to regain her power - this involves retrieving her spell book found on the 12th screen. To get there she needs to collect various tools and spells. To get spells she has to blast at flying ingredients. If Fiona fails she gets sent to Hell where all is burning rocks and demons.

Graphically it's a reasonable though not staggering game and the music - gothic Bachian type stuff - is a bit reminiscent of other games. Still, there are a few original ideas and you get a free game, *Daredevil Dennis*, on the other side of the tape.

Program *Fiona Rides Out*
Price £7.95
Micro Commodore 64
Supplier Viper
Eardley House
182/184 Campden
Hill Road
London W8

BUDGET

It's always difficult to see why the average person would want to keep their bank account on a micro.

People seem to forget that whilst a computer can tell you

all sorts of clever things about current totals, standing orders, you do have to remember to type things in.

Can you really imagine having a regular time when you sit at your computer and input all the cheques you've written, to whom, and when?

If you can then *OL Bank Account* is very good. Microdrives mean that, at least, compared to tape, the program loads quickly, as do file records. The design is simple to use, there are 17 budget headings under which outgoings may be filed, and once you enter the basic details of a standing order the computer will include it in each month's balance automatically.

You can dump statement details to Epson printers, but there is an ominous warning that should you start the print out process with no printer attached, the program will hang up and you have to restart the program with all the current information in the computer being completely lost.

This is not Cenprime Software's fault but Sinclair's. I mention it because it is these kind of annoying hiccups that have plagued the C64 since its introduction.

Program *OL Bank Account*
Price £19.95
Micro C64
Supplier Cenprime Software
■ Castle Street
Rugby
CV21 2TP

ILL-DEFINED

C5 Clive is a cheapie £1.99 game from Scorpio Software.



Really the only noteworthy feature of the game is that it features a C5. But since this is, in fact, a tiny little user-defined graphic that could equally well be a piece of cheese that element is hardly crucial.

The game is a standard dodge the baddies game mixed with a sort of bike jump-type game. You move the C5 up and down past odd objects collecting batteries (God knows, you need them) and then leap over things like people and buses.

Objects are, without exception, blobby and ill-defined, and whilst it's cheap I think this one is below the average level of, say, a Mastertronic game.

Program C5 Clive

Price £1.99
Micro Spectrum
Supplier Scorpio Software
307-313 Corn Exchange Building Cathedral Street Manchester 4

RECREATION

Yes, it's the one Commodore 64 game players have been waiting for - *Elite* on the C64. Written by Ian Bell and David Braben, who wrote the BBC version, it is a faithful recreation of the original, with a few extra features included.

The colours on the various displays have been greatly enhanced - now you have four colours for the view screen and eight for the status panels. This means that you can actually have glorious orange explosions as your missile tear through the fragile skin of your target.

What it really means, of course, is that the displays are far clearer, much easier to understand, and somehow crisper. It all adds to the illusion of being in the cockpit of your Cobra Mark III.

The C64 *Elite* also has music - but only for the docking sequences. And guess what it is - that's right, da-da-da-da, du-du, du-du, etc - the Blue Danube.

In addition to the command that turns the music on/off, you can also remove the lines that you see on the planets - this speeds up the whole



game. There are also a lot of extra features that aren't mentioned in the instruction book - this is deliberate, so I shan't spoil them for you.

Bell and Braben have done an excellent job converting their game for the Commodore, it plays superbly and it seems to be as fast as the BBC version.

Program Elite

Price £17.95
Micro Commodore 64
Supplier Firebird Software Wellington House Upper St Martin's Lane London WC2H 9DL

TRUMPED

Bridge for the Amstrad from Kuma is one of the first versions on this machine of this classic card game. The difficulty of implementing *Bridge* on the computer, I reckon is programming the computer to play the cards convincingly after the bidding.

Kuma's *Bridge*, after testing, was declared by those in the office who know, to be a sound but overly cautious bidder, which probably means it would be good for practising with.

Graphically the game is very impressive - the high resolution Amstrad screen is well suited to clearly displaying fine detail and there is much use made of it in this program. Hands are very clearly depicted and bidding, score, tricks and cards are all displayed on screen.

Program Bridge

Price £8.95
Micro Amstrad
Supplier Kuma Computers 12 Horseshoe Park Pangbourne RG8 2JW

New Releases

DIVIDED

Danger Mouse in Double Trouble is now available on the Amstrad. Graphically it's marvellous - the design for the main characters is taken straight from the original sketches for the cartoon. As a game I'm not so sure.

I always think it's a bad sign if a game is divided into sections - separate games are too often bogged together with no real attempt to unify them. The idea is that three inferior games, not good enough to stand up on their own, may produce an acceptable end result if you put them together. It doesn't work.

Not that *Danger Mouse* is the worst example of this syndrome, the effort that has gone into the graphics prevent that. It's more a question, I think, of not really having a good idea for the game - what you get instead are three OK ideas.

The sections are these: *Danger Mouse* is first seen with Penfold flying in his aerocar. At different height

levels they are confronted by different baddies and must launch the correct repellent. Stage two is a jungle game - jump over the swamp avoiding the crocodile and then climb the tree using the swinging monkeys. Part three is a form of *Mastermind* with an excellent *Danger Mouse* animated sprite trying to match a coloured pattern.

If you like *Danger Mouse* and great graphics you may love this, but for pure game alone I can't recommend it.

Program *Danger Mouse in Double Trouble*

Price £7.95

Micro Amstrad

Supplier Creative Sparks

Thompson Houses
296 Farnborough
Road
Farnborough
Hants GU14 7NF

BLOCKAGE

Pipeline by Taskset on the Commodore was one of the more inventive games on the machine, the basic idea being to keep the water flowing through a pipe by constantly repairing the blockages that appear in it. This means moving a little workman figure around - there are the compulsory nasty objects zooming around to make things tough. A simple basic idea that worked.

The game has been produced for the Spectrum by Viper. In the admirable intention of doing a sophisticated job the programmer has, I feel, somewhat spoilt it. Basic game plan is the same - move your workman around the pipe taking him to each new blockage.

Pick of the week

HARD LUCK

Whatever you believe someone or something somewhere is going to prove you wrong and so it is with gritted teeth that I own up to finding a *Manic Miner* derived game with an alternative title utterly wonderful.

The game is *Dynamite Dan* and it has a main character who looks incredibly like Sebastian Flyte and appears to loll about as though surveying the dreamlike spires. Let's dismiss the plot quickly - collect the sticks of dynamite, blow up the safe, collect the papers and escape. The usual, in other words.

What makes the game is the graphics - large, witty, bizarre and beautifully animated and not a colour resolution problem in sight (well, very very few, anyway). Visually the game looks a little like the recent *Mikro Gen Wally*.

The game is packed with screens and, more significantly none of them are

throwaways, each has something remarkable, and horribly difficult puzzles in the left-right-jump tradition; as ever, timing is all.

Aside from the expected vast collection of assorted bouncing sprites the game features elevators, transporters, a river that runs along the bottom of several screens with a boat that is very difficult to catch and appears very rarely, and the oddest hard luck screen I've seen - you are executed by a funny man in a spaceship who then turns to face you, grinning madly.

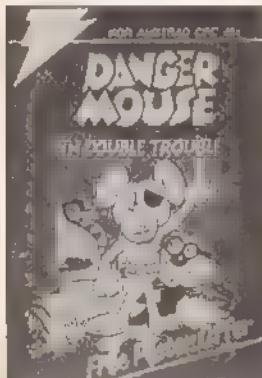
Dynamite Dan is not just another Miner surrogate and is at least as essential to your collection as the original. It's a pity about that name, though.

Program *Dynamite Dan*

Price £6.95

Micro Spectrum

Supplier Microsoft
Holborn Circus
London EC1P 1DO



But Viper has produced large sprites for the workman and 'you' (a sort of foreman figure) in the Wally vein, which would be fine except that they have become difficult to move using the most sensitive joystick we have. It proved hard to move them smoothly around the maze of pipes.

Even if you argue that it's just something you have to get used to, it doesn't alter the fact that the big sprites look wrong for the game and I

found it surprisingly off putting.

A contentious one then, not dross but not much fun to play either. You may react differently.

Program *Pipeline*

Price £6.95

Micro Spectrum

Supplier Consolidated Software Marketing
182/184 Campden Hill Road
London W8 7AS

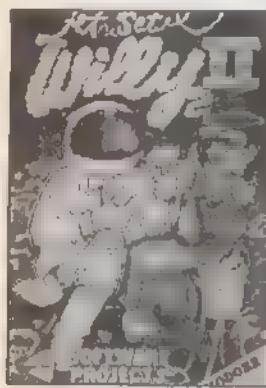
This Week

Program	Type	Micro	Price	Supplier	Rhythm + Pitch	■	Commodore 64	£9.95	Chalksoft
Smuggler's Cave	Ad	Amstrad	£5.95	CRL	QL Bank Account	■	QL	£18.95	Capprime
Danger Mouse Dbl Trbl	Arc	Amstrad	£7.95	Creative Sparks	A View To A Kill	Arc	Spectrum	£10.95	Domark
Timebomb	Arc	Amstrad	£6.50	Black Knight	Ancient Quests	Arc	Spectrum	£7.95	Mirrorsoft
Bridge	S	Amstrad	£8.95	Kuma	C5 Clive	Arc	Spectrum	£1.99	Scorpio
Handicap Golf	S	Amstrad	£8.95	CRL	Dynamite Dan	Arc	Spectrum	£8.95	Mirrorsoft
Hack Attack	■	Amstrad	£5.95	Ash Byproducts	Happy Hour	Arc	Spectrum	£1.99	Scorpio
Mastercalc	UI	Amstrad	£19.95	Amsoft	Phinnes Frog	Arc	Spectrum	£7.95	Mirrorsoft
Mr Frosty + Penguins	Arc	Commodore	£1.99	Scorpio	Pipeline	Arc	Spectrum	£6.95	Viper
A View To A Kill	Arc	Commodore 64	£10.95	Domark	Planet Attack	Arc	Spectrum	£1.99	Scorpio
Fiona Rides Out	Arc	Commodore 64	£7.95	Viper	Turntakking	Ed	Spectrum	£5.95	Learning Proces
Jet Set Willy II	Arc	Commodore 64	£7.95	Soft Projects	Key: Ad - adventure. Arc - arcade. Ed - education.				
Way Exploding Fist	Arc	Commodore 64	£9.95	Melbourne House	S - strategy-simulation Ut - utility				

New Releases

SNEAKY

Jet Set Willy II is not alas, the legendary Willy and the taxman but is the deluxe souped-up version of the original *Jet Set Willy*. Souped



up primarily in that it has 100 rooms, almost twice the original.

The layout is mostly the same. The new rooms have been placed all together high up in Willy's mansion forming a second storey. Best addition of all, though, is the fact that now you can go down the famous toilet in the first screen. In the original game just about everybody tried to do it but now you can actually go somewhere.

Some of the new screens are very good with many sneaky references to other games thrown in. 'Attack of the' is related to an ancient Imagine game called *Jumping Jack* in which you have to leap up a screen with each level consisting of a floor that rushes left and right and frequently produces holes you fall down.

Getting to most of the new

rooms means finding a spaceship and activating it - a neat way of fitting in the rooms without upsetting the layout of Willy's Mansion. There's nothing dramatically new about the game, of course, but the new rooms are, in many cases, inventive and fiendish. The milling hoards of *Jet Set Willy* addicts should be delighted.

Program *Jet Set Willy II*
Price £7.95
Micro Commodore 64
Supplier Software Projects
Bearbrand Complex
Allerton Road
Woolton
Liverpool L25 7SF

WAR GAMES

Battlefields is a two game package for the BBC B, published by the BBC itself. Both games are wargames - one is the Battle of Waterloo, the other the American Civil War.

The screen display on both games is rather uninspiring, but no doubt this is due to the limitations on the good old Beeb.

Waterloo has a dark blue background with a few trees and little huts scattered around, representing forests and towns.

The players take it in turns, first the Allies, then the French. Each side has ten units, with a mixture of cavalry, infantry and artillery. Cavalry units can move two squares, infantry units one.

More care should have been taken with the program; it refuses to recognise lower

case input for the movement orders.

On the plus side, this is one of the few two player games I have seen that makes any use of the computer to generate a realistic feel.

Enemy forces are not shown unless one of your units is next to them, in which case you get a sighting report.

Civil War, although it covers a far larger area, is very similar. Again each side has ten units, but each unit can move up to eight squares.

The objective is to score points by occupying enemy territory - each square conquered scores one point.

I can't help feeling that both games are rather too simplistic, both in terms of presentation and actual play.

The usual drawbacks to two player computer wargames are to some extent ameliorated, but I would have preferred a computer opponent.

Program *Battlefields*
Price £9.95
Micro BBC B
Supplier BBC
35 Marylebone High Street
London W1M 4AA

REVISION

Sphere, the book publisher, has just issued a range of educational titles for O level students. They are easy to summarise and simple in scope - each one consists of dozens of revision questions on each subject presented in the form of a multiple choice exam.

That's it really, the programs have no other function

beyond helping O level student test themselves - if you get something wrong the right answer is given but no explanation is offered. Although questions are divided up into subject areas revision can be confined to particular - you can take a general test on all subjects if you wish.

So, if revision aids are what you need, then at present the range covers Biology, Mathematics, Physics and Chemistry. It won't actually teach you anything, though.

BIOLOGY

Examination Papers & Study Guide



Program *Biology*
Price £8.95
Micro Spectrum
Supplier Sphere
30-32 Gray's Inn Road
London WC1X 8JL

Compiled by Graham Taylor

New Releases is designed to let people know what software is coming on the market. If you have a new game or utility which you are about to release send copy and accompanying details to New Releases, Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD.

This Week

Amsoft, Brentwood House, 169 Kings Road, Brentwood, Essex. 0277 230222. **Ash Byproducts**, 183 Bristol Road, Edgbaston, Birmingham B5 7UB. **Black Knight**, 50 Slades Drive, Chislehurst, Kent BR7 6JX. 01-467 7451. **CRL**, CRL House, 9 Kings Yard, Carpenter's Road, London E15 2HD. 01-533 2918. **Cenprise**, 933 Foleshill Road, Coventry CV6 5HN. 0203 686162. **Chalksoft**, 37 Willowsead Road, Worcester WR3 7QP. 0905 55192. **Creative Sparks**, Thompson House, 296 Farnborough Rd, Farnborough, Hants. 0252 543333. **Domark**, 204 Worple Road, London SW20 8PN. 01-947 5624. **Kuma**, Kuma Computers, 12 Horseshoe Park,

Pangbourne RG8 7JW. 07357 4335. **Learning Process**, 38 Homedale House, 3 Brunswick Road, Sutton SM1 4DG. **Melbourne House**, 39 Milton Trading Estate, Abingdon, Oxon OX14 4TD. 0235 835001. **Mirrorsoft**, Mirror Group, Holborn Circus, London EC1P 1DQ. 01-353 0246. **Scorpio**, 307-313 Corn Exchange Building, Cathedral Street, Manchester 4. 061 834 2292. **Soft Projects**, Bear Brand Complex, Allerton Road, Woolton, Liverpool L25 7SF. 051 428 7990. **Viper**, Eardley House, 182/184 Campden Hill Road, London W8 7AS. 01-221 3592.



Written word

Every so often good ideas do emerge from the collective endeavours of those in the computing field. And more often than not they appear briefly, and then sink without trace.

Take icons for example. An increasingly strong band of manufacturers now believe that icons with either mice or touch screens are the way for the future.

I'm not so sure. The idea behind icon thinking is to develop a system to use a computer with a kind of prompting with pictures. Yes, it is true that it is simpler to indicate a disc icon with a mouse pointer than to type 'Save B:\filename', but even so, in ordinary use still the main body of work with the computer involves typing in alpha-numeric information using a keyboard.

Most information given to the computer must still be in a written format and is stored in that form. This is inefficient. The less adept the typist is, the slower the information is entered into the machine. How can the author be freed from the tyranny of the keyboard? Icons certainly don't go far enough.

Instead of using symbols to represent the words, the user could actually use the words themselves - ie, dictate to the computer.

It is, perhaps surprisingly, the telecommunication companies which are at the moment concentrating on developing speech recognition/generation systems. The computer companies do seem to see the possibilities in doing away with the keyboard altogether, and are investing their money in the idea of icons *et al*. Even so, within another ten years we should have an adequate speech interpreter. NEC's general manager has claimed "We're 10 or 20 years off a speaker-indepen-

dant, large vocabulary, connected speech recognition system."

Speech generation - the other side of the communication gap - is now so far advanced that even home micros costing under £100 can be fitted with £30 speech generators.

So, by the turn of the century or before, all computers could well be dealing with the outside world using the spoken word. Everything - from international businesses' man-frames to the local village shop's stock-taking micro - will be able to speak to their user and listen to the reply. The system would be cheap enough to be implemented even on home micros.

One immediate effect will be in publishing. The cost of publishing a book will be measured by how much memory it takes up - and given the way prices are falling at the moment, coupled with the enormous market for memory chips once 'home publishing' becomes feasible, even specialist books should not cost over £5.

With artificial intelligence, then the computers would no longer merely be able to respond to our orders, they would be able to explain difficult passages. Further, there would no longer be any language barriers. Already the EEC is using a system called Systran - for analysing and translating written language.

Next year a much more powerful machine, Eurotra, is to be brought into service, which will deal with all the 42 different European languages and their variations.

Suddenly, the keyboard will no longer be needed to communicate with computers, all one need do is speak to them. As soon as this happens, popular books will speedily be put on the systems. If the language analysis programs pattern recognition systems are sophisticated enough it will merely be a matter of letting a computer scan each page of a book - possibly a ten minute operation - and at the same time the computer will be able to assimilate any pictures or graphics for it to display on screen.

Fifty years from now written language could have all but disappeared. The most permanent form documents would take would be as digital codes stored in the computer's memory.

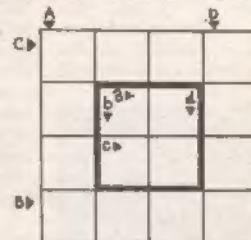
Who will need to read or write then?

Andrew Mulholland

Number puzzle

Puzzle No 162

Here is an unusual crossword puzzle:



In the grid, *a*, *b*, *c* and *d* are four two-digit numbers which interlock in the centre four squares (*a* and *c* are numbers across, and *b* and *d* are numbers down).

The squares of these numbers are represented by the capitals *A*, *B*, *C*, and *D* which fit in the perimeter squares. Can you find their values?

Solution to Puzzle 157

The only way of reaching the maximum score without being eliminated is if the first dart lands on the '13'.

```

10 DATA 20,5,12,9,14,11,8,16,7,19,3,17,2,13,19,
5,19,4,16,1,20,5,12,9,14,11,8,16,7,19,3,17,2,13
19,5,13,4,19,1
20 FOR START=1 TO 20
20 RESTORE
20 IF D=0 IF D>START THEN GOTO 20
20 LET T=START
20 FOR N=1 TO 19
20 READ S
20 LET T=T+S
20 IF T>START-INT(T/START) THEN GOTO 120
109 NEXT N
110 PRINT START
120 NEXT START

```

In the program the scores for each of the segments of the segments of the board (taken in an anti-clockwise direction) are stored in the *Data* statement. These are repeated to allow a full run of 20 scores from any start position. The program tests each start score in turn and sums up the totals for each by reading from the *Data* line.

Winner of Puzzle No 157

The winner is M. W. Peters, of Spetisbury, nr Blandford, Dorset, who receives £10.

Rules

The closing date of Puzzle No 162 is July 10.

The Hackers





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YOU

as . . .



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Enterprise 64
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Commodore 64 £9.95

Amstrad CPC 464 £9.95



MIKRO-GEN

44 The Broadway, Bracknell, Berks. 0344 427317

